THE BRICKBVILDER
AN ARCHITECTVRAL MONTHLY

VOLVME XXII AVGVST 1913 NVMBER 8

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CHURCH OF HAGIA THEODORA,
ARTA, EPIRUS, GREECE.

Herringbone diaper and other patterns, embedded in thick mortar. Fourteenth Century.

THE BRICKBVILDER

AVGVST, 1913

VOLVME XXII. NVMBER 8.

Acoustic Design in the Hill Memorial Auditorium, University of Michigan.

BY HUGH TALLANT.

DURING the summer and fall of 1910 there appeared in THE BRICKBUILDER a series of articles entitled "Hints on Architectural Acoustics." These articles explained that good hearing depends upon the loudness, the distinctness, and the quality of the effect produced by sound; gave methods for obtaining satisfactory acoustic qualities in an auditorium by means of modifications in its shape, arrangement, equipment, materials, and method of construction; and illustrated the procedure in the case of several interiors laid out along the lines suggested. Since that time, thanks to the courtesy of Mr. Albert Kahn, there has been presented an opportunity for corroborating these principles on a much larger scale, and with much greater accuracy and thoroughness, than ever before. The acoustic results thus obtained in the Hill Memorial Hall, of which Mr. Kahn was the architect, have more than justified the study and attention devoted to them, and may, therefore, be of sufficient general interest to warrant an outline of the principles and methods by which they were obtained.

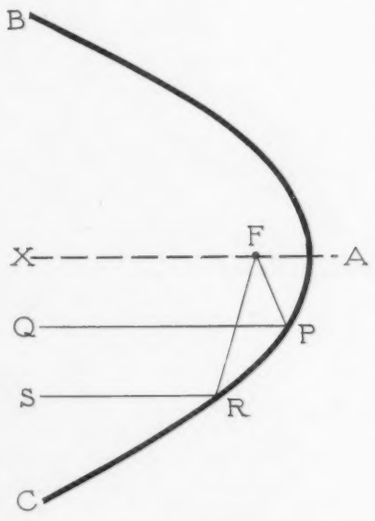


FIG. I.

The problem was to construct an enclosure in which five thousand people might enjoy the graduating exercises of our largest university. As the student speakers at a college commencement are not necessarily of unusual vocal capacity, they obviously require conditions of hearing specially well adapted to the purposes of public speaking. Ample loudness combined with distinctness was, therefore, the fundamental acoustic requisite in the case of the Hill Memorial Hall, but quality of tone was a matter of only less importance, as the building was to be used for musical productions of all kinds and for choral singing in particular.

It may be stated that, as a general principle, there is always plenty of sound in any auditorium. The difficulty, so far as loudness is concerned, arises from the fact that the effect is usually much too loud near the speaker and correspondingly too faint elsewhere. If, on the contrary, conditions could be averaged — if, in other words, the sound could be equally distributed throughout the entire audience — the result would be ample loudness at all points. With this end in view, it occurred to the writer that, as sound is reflected in exactly the same manner as light (the angle of incidence being equal to the angle of reflection), the principle of the ordinary search-light reflector might be utilized to advantage on a much larger scale for the reflection of sound. As every one knows, the search-light reflector prevents the light rays from spreading, with the result that the illumination retains its brilliancy to a very great distance. It seemed reasonable to infer that an auditorium laid out along these lines would reflect the sound in such a way as to maintain its intensity in all parts of the enclosure. The principle of the seach-light reflector was, therefore, adopted as the basis of the acoustic design of the Hill Memorial Hall.

The particular shape to which the search-light owes its efficiency is, of course, the surface known in geometry as the paraboloid of revolution. It is the surface obtained by revolving a parabola about its axis. In the diagrams accompanying the present article this surface will be represented by the parabola resulting from its intersection by a plane passing through its axis. Thus in Fig. I the paraboloid is represented by the parabola B A C, although the real surface would be obtained by spinning the parabola about its axis A X.

The property upon which the search-light is based is the fact that every ray of light emanating from the focus F, Fig. I, is reflected in a direction parallel to the axis A X. Thus rays such as F P and F R are reflected in the directions P Q and R S, parallel to A X. Applying the same principle to the reflection of a sound-wave, it follows that any small part of the wave (which, for convenience, will be called a *single sound*) will be similarly reflected in a direction parallel to the axis. In this way the natural tendency of the sound-wave to expand as it recedes from

the starting point is entirely checked so far as the reflected portion of the wave is concerned, and this portion will, therefore, produce an effect at Q just as loud as at P and an effect at S just as loud as at R.* This fact very much simplifies all the calculations for loudness. Its bearing will be better understood by considering the shape assumed by a sound-wave starting from the focus of the paraboloid and subsequently reflected from the enclosing surface.

In Fig. II the paraboloid is again represented by the parabola B A C. For the present purpose it may be assumed that the sound-wave originates in the form of a spherical surface of compressed air of which the focus F is the center.† This spherical surface is represented by the circle P Q R.

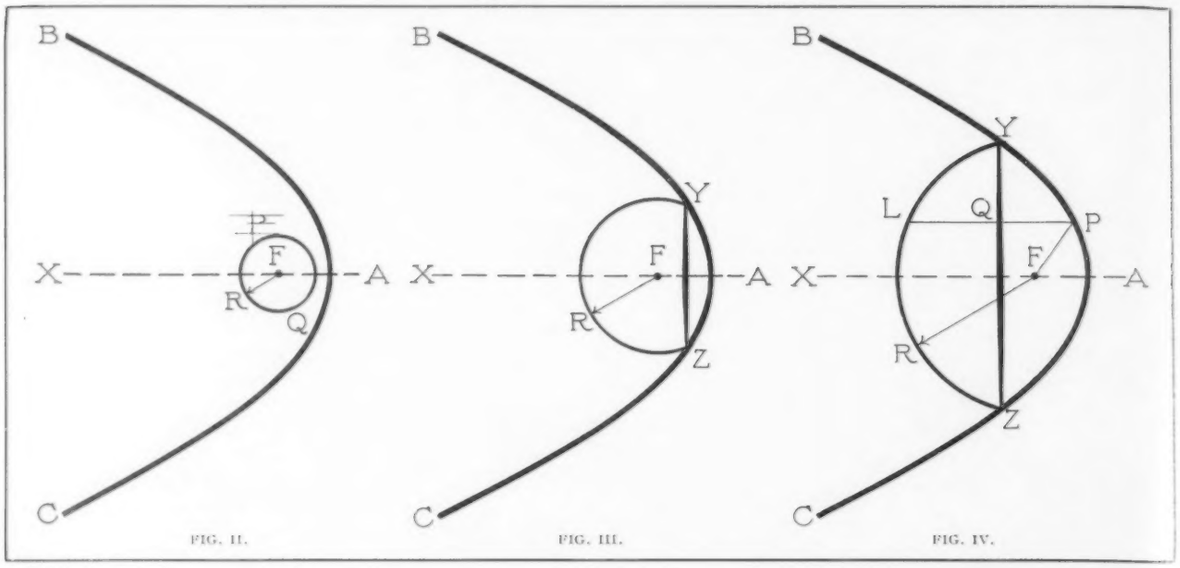


FIG. II. FIG. III. FIG. IV.

Fig. III shows what happens when the wave has spread far enough from its starting point to strike against the inner surface of the paraboloid. The part of the wave which has struck the paraboloid is reflected in the form of a plane surface represented by the line Y Z. The remainder of the wave still continues to expand in the form of a spherical surface as represented by the arc Y R Z of which F is the center and F R the radius. The relative intensity of the sound at different points of the wave is indicated by the thickness of the lines which represent the wave front on the diagram. Thus the flat part of the wave is shown thickest at its center because the sound is more intense at this point. On the other hand the spherical portion of the wave is represented by a uniform line because the intensity of the sound is the same at all points on the spherical surface.

Fig. IV shows the shape of the wave a little later on, when the reflected portion has passed beyond the focus F. Under these circumstances a man standing at the point L will hear first the direct or spherical portion of the wave Y L R Z and next the reflected or flat portion Y Q Z. If the flat portion of the wave reaches him less than one-fifteenth of a second after the spherical portion — if, in other words, the distance Q L is 75 feet or less ‡— he will perceive the two portions of the wave in the form of a single sensation of hearing each louder than the effect which either part of the wave would have produced alone.

In applying this principle to the Hill Memorial Hall the first problem was to adjust the parabolic surface to the requirements of architectural design and decorative effect. As a matter of geometry the paraboloid was first limited by surfaces corresponding to the side and rear walls, the ceiling and the floor. The resulting shape which the auditorium thus assumed is shown in plan in Fig. V and in vertical section in Fig. VI. In Fig. V the side walls are indicated in plan by the lines E B and D C and in Fig. VI their intersection with the paraboloid is indicated by the parabola H I J. The intersection of the ceiling with the paraboloid is similarly represented in Fig. V by the parabola E G D and in Fig. VI by the horizontal line O H K. The rear wall is represented in Fig. V by the curve E M D and in Fig. VI by the vertical line O P. Finally the main floor is represented in Fig. VI by the line P N J L. Photographs of the completed building reproduced on another page in the present issue of THE BRICKBUILDER show how this geometric layout was subsequently developed in architectural scheme and detail.

The influence of the wall and ceiling surfaces upon the shape of the sound-wave is shown in Fig. VII. If there had been no side walls the wave would have taken the form of the spherical surface Y R L Z and the plane surface Y Q Z. The wall D C, however, intercepts and reflects the portion of the wave represented by the dotted line S Z G, with the result that this portion assumes the form of the spherical surface S N, of which the center is at F′ symmetrical to F with reference to the line D H. The loose end N of this wave also spreads out still further by diffraction as shown by the arc N O of which C is the center. Under these circumstances a man standing at L will hear in suc-

* An unimportant modification of these conditions results from the sideways movement or diffraction of the sound-wave.

† The precise shape of the sound-wave produced by a speaker's voice will be discussed in a subsequent article.

‡ See THE BRICKBUILDER for May, 1910, pages 113 and 114.

cession three sound-waves, namely: the direct spherical wave R L S, the flat reflected wave I Q G, and the reflected spherical wave S N O, and if these three waves reach him within the same sixteenth of a second he will perceive all three as a single sensation of hearing. In exactly the same way a still further portion of the wave is reflected down from the ceiling so that people in the extreme rear of the auditorium hear this fourth portion in addition to the other three. As a result the audience in what are apparently the worst parts of the hall hear quite as loudly as anywhere else. Indeed tests in the completed building have shown that the effect in the extreme rear corners is actually louder than at corresponding points in the center of the hall, and the carrying power is so intense that the noise of a dime dropped upon the floor of the stage from a height of a quarter of an inch can be readily perceived at the extreme rear of the second balcony over 150 feet away.

The actual acoustics diagram used in laying out the interior of this building is reproduced in Fig. VIII. It is the culmination of a long series of studies laid out successively in true architectural fashion upon superimposed sheets of tracing paper. The final study was ultimately drawn up on detail paper with extreme care and with sufficient accuracy and delicacy of line to permit of scaling the dimensions to within less than an inch. For convenience of reference the essential data were traced from this drawing upon the acoustics diagram as given.

Certain points in connection with this diagram require special mention. In the first place, as the speaker was likely to move a little from the exact center of the platform, the paths of certain important sounds were separately laid out from two points corresponding to this possible variation in the starting point of the sound. The two locations of the speaker will be readily seen on the acoustics diagram together with the corresponding sound-paths. To avoid confusion the paths corresponding to one position are indicated by continuous lines, while the paths corresponding to the other position are indicated by dotted lines. In this way the conditions of hearing under the overhang of the balconies and at other critical parts of the hall were separately checked for the extreme variations which were likely to occur.

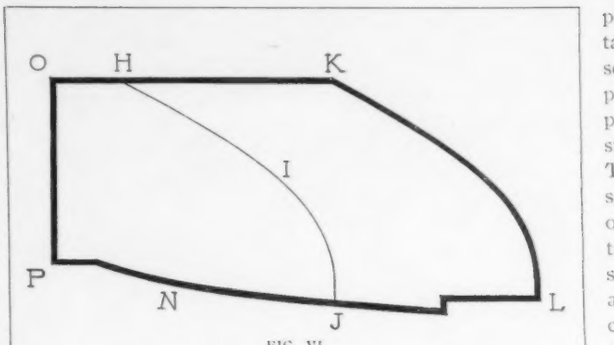


FIG. VI.

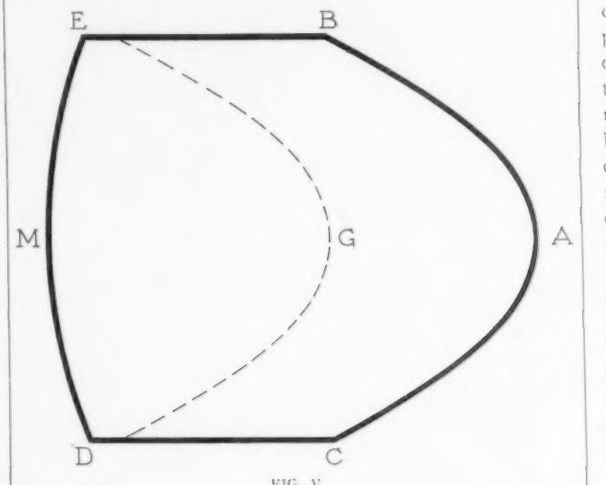


FIG. V.

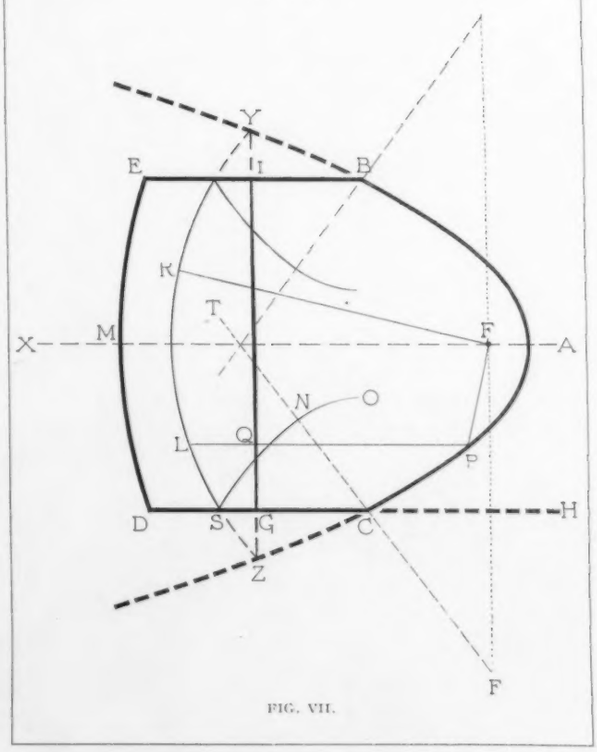


FIG. VII.

The next difficulty was due to the fact that an organ was to be installed in a large archway directly behind the speaker, and that consequently this portion of the paraboloid could not be counted upon as a reflector. To overcome this difficulty the speaker was assigned to a location somewhat in front of the focus of the paraboloid so that the reflected sounds should have a tendency to converge. As a result the gap in the reflected sound-wave closes itself up within 53 feet, at most, of the speaker. At less than this distance from the speaker the direct wave is strong enough to furnish all the loudness necessary. Beyond the 53 feet the direct wave has the support of the reflected wave.

Another point which received special attention was the reflection of the sound to the extreme rear seats under the balconies. This was a very important consideration because without the help of the reflected sound the effect under the balconies was likely to be much too faint. When the paths of the reflected sounds

were first accurately plotted it was found that owing to their convergence (on account of the organ) they slanted downwards toward the back of the auditorium, and were intercepted by the balcony-fronts before they could reach the rear seats below. To overcome this difficulty the axis of the paraboloid was inclined slightly upwards so that the downward slope of the reflected sound-paths might be correspondingly lessened. The inclination of the axis was made just sufficient to enable the reflected sounds to pass under the lower edge of the balcony-fronts to the rear seats below. As a result of this precaution the reflected sound reaches all points under the balconies and the effect is everywhere amply loud, although in the case of three extra rows of seats recently added at the back of the main floor there is a perceptible diminution in loudness. The paths by which the reflected sounds reach the rear seats will be seen on the diagram passing just under the balcony-fronts. The angle at which the axis of the paraboloid was inclined is also indicated in the lower left-hand corner of the drawing.

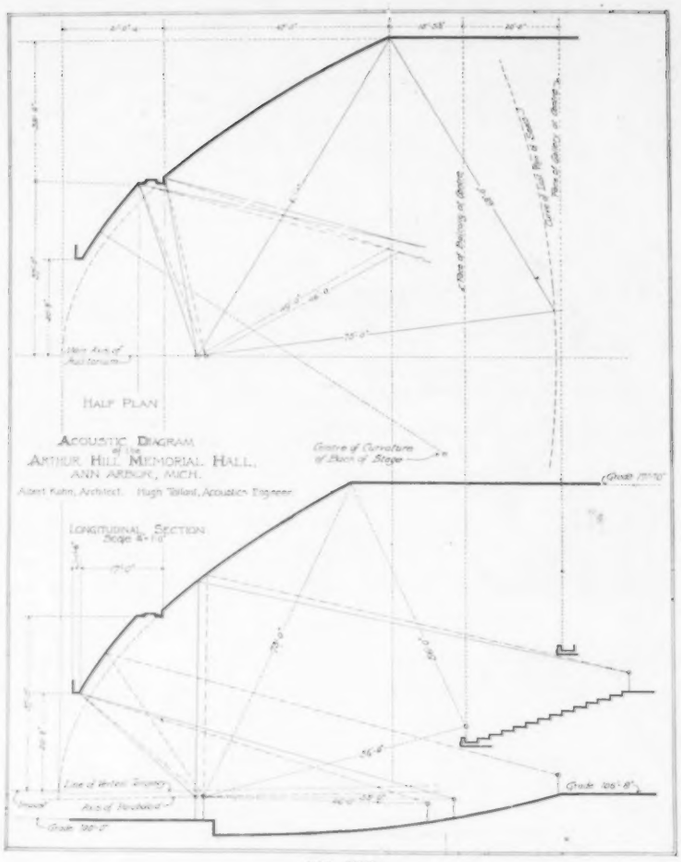


FIG. VIII.
ACOUSTIC DIAGRAM OF THE HILL MEMORIAL HALL.

Still another point which will be found worked out on the plan is the length of time which elapses between the first arrival of the direct portion of the wave and the subsequent arrival of the portion reflected from the side walls. As has already been mentioned, it was essential that the path by which the reflected sound reaches any given hearer should not be more than 75 feet longer than the path by which the direct sound reaches him. These paths are shown and figured on the plans. As will be seen, the sound reflected to the critical point moves through a distance of 80 feet before reflection and 68 feet after reflection, or a total of 148 feet. The direct sound moves through a distance of 75 feet to reach the same point, or only 73 feet less than the reflected sound. Both direct and reflected sounds, therefore, reach the hearer at this point within one-sixteenth of a second of one another and combine to produce a single initial sensation of hearing. The reflection of the sound from the ceiling to the front of the first balcony will be found similarly checked on the section. In this case the sound reflected to the critical point moves through a distance of 73 feet before reflection and 56 feet after reflection, or a total of 129 feet. The direct sound moves through a distance of 56 feet to reach the same point, or only 73 feet less than the reflected sound.

The question of loudness having thus been met in a satisfactory manner, the next question was that of distinctness. As was explained in "Hints on Architectural Acoustics,"* indistinctness arises from three causes, namely: interrupted reverberation, excessive reverberation, and sound-interference. Interrupted reverberation is a perceptible interruption or break in the early part of a reverberation. It occurs whenever there is a fifteenth of a second or more during which no sound is reflected to the hearer, and produces the effect of a very quick echo or repetition of the sound. In the case of the Hill Memorial Hall there seemed reason to believe that such an interruption would occur in certain parts of the auditorium. On the other hand, careful calculation indicated that the initial loudness obtained by the methods already described would be so great as practically to drown out the tendency to echo. In point of fact this is exactly what occurs, and no echo or sound-repetition is noticeable under normal conditions. At the same time the difficulty was very narrowly averted, for it has been found by experiment that if the speaker turns his back to the audience at certain critical points (thereby reducing the initial loudness to a minimum), an echo is distinctly perceptible.

Just how long a reverberation may last without becoming excessive is a problem which has not yet been authoritatively solved. From such data as the writer had been able to collect† it appeared that in an auditorium of the size of the Hill Memorial Hall—about 800,000 cubic feet—a reverberation lasting two seconds would not be excessive for purposes of speaking, and would be better than a shorter reverberation for purposes of music. Unfortunately, however, the cement floors of the Hill Memorial were to be uncarpeted and there was to be little upholstery on the seats, so that the amount of reverberation was likely to be much greater when the hall was empty than when

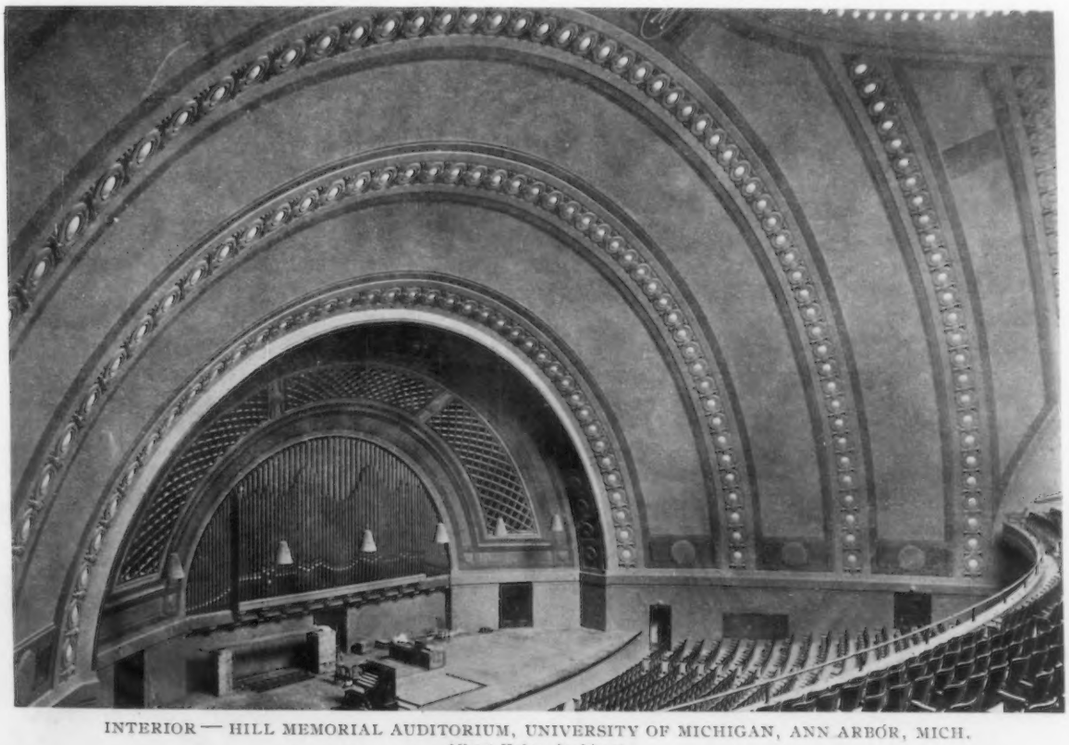
*See THE BRICKBUILDER for October, 1910.
† See THE BRICKBUILDER for November, 1910, page 245.

there was an audience present. Under these circumstances the various wall, floor, and ceiling surfaces were adjusted to a calculated reverberation of 1.7 seconds when all seats were filled. This gave a reverberation of 2.4 seconds when only half the seats were filled and of 4.0 seconds when the hall was empty. In actual practice the reverberation is not excessive for speaking purposes when only half the seats are filled. When the hall is empty — except for the experimenters — a speaker can still be heard clearly if he restricts himself to a conversational tone of voice, but he is apt to evoke a little too much reverberation if he raises his voice in true oratorical style.

EXTERIOR.

Sound-interference is produced mainly by sounds reflected from the rear wall of an auditorium. As there was no carpeting or other natural sound-absorbing surface to which such disturbing sounds could be reflected and destroyed, an artificial absorbent consisting of camp cloth over felting was applied to the rear walls. The coefficient of absorption of this combination is about 0.62, which proved adequate to the purpose in hand. The material was disposed in panels enclosed by a heavy raised moulding, and the cloth, being of the same shade as the painted plaster, harmonizes satisfactorily with the general decorative scheme.

As there is practically no woodwork in the building, the quality of tone is wholly dependent upon the reverberation above mentioned. It is obvious that with such a possible variation in the length of the reverberation — from 1.7 seconds to 4.0 seconds — the conditions cannot be equally satisfactory at all times. To the writer the reverberation of 1.7 seconds seemed obviously insufficient for the choral singing at the dedication exercises. On the other hand such musical opinion as has hitherto been obtained has been extremely favorable, not to say enthusiastic; but it must be admitted that such expressions are apt to be biased by courtesy. Moreover, as explained in "Hints on Architectural Acoustics," the ear has apparently a tendency to accept volume of sound as a substitute for quality. In the Hill Memorial Hall there is no question concerning the volume, but a categorical statement with regard to the intrinsic quality would probably be premature.



INTERIOR — HILL MEMORIAL AUDITORIUM, UNIVERSITY OF MICHIGAN, ANN ARBOR, MICH.
Albert Kahn, Architect.

Some Suggestions as to the Making of Working Drawings.

CONCLUSION OF SECOND PAPER.

BY H. VAN BUREN MAGONIGLE.

ATTENTION was called in the first part of this paper (THE BRICKBUILDER for July, page 148) to the interesting comparison between the ways of arriving at a result in private practice with those in the office of the architect of the New York Board of Education, Mr. C. B. J. Snyder, and of Mr. Oscar Wenderoth, Supervising Architect of the Treasury Department. It was shown that standardization for private practice was very difficult except in minor particulars, while in work where millions of dollars are spent every year for one type of building alone it becomes practical to standardize certain types of plans, details of staircases, details of construction and equipment, etc. Three working drawings from Mr. Snyder's office are illustrated in this number, and show the methods referred to in the last issue.

In the office of the Supervising Architect of the Treasury Department, where again a vast quantity of work is done every year, the general practice is to adopt a standard size of 24½ inches by 37 inches for working drawings and 40 inches by 10 feet for full size details. At the present time a rubber stamp is used for the titles, which has a place in it for the insertion of the number by hand, and the numbering is systematized as follows:

1 to 99 ..... Scale plans.
100 to 199 ..... Scale elevations and sections.
200 to 299 ..... Scale details.
300 to 399 ..... Miscellaneous (standard) scale details.
400 to 499 ..... Structural drawings.
500 to 599 ..... Full size details.
600 to 699 ..... Mechanical drawings.

Adding the letters "P," "H," "L," etc., to designate Plumbing, Heating, Lighting, etc.

700 to 799 ..... Repairs.

Adding the letters "P," "H," "L," etc., for the mechanical repair drawings.

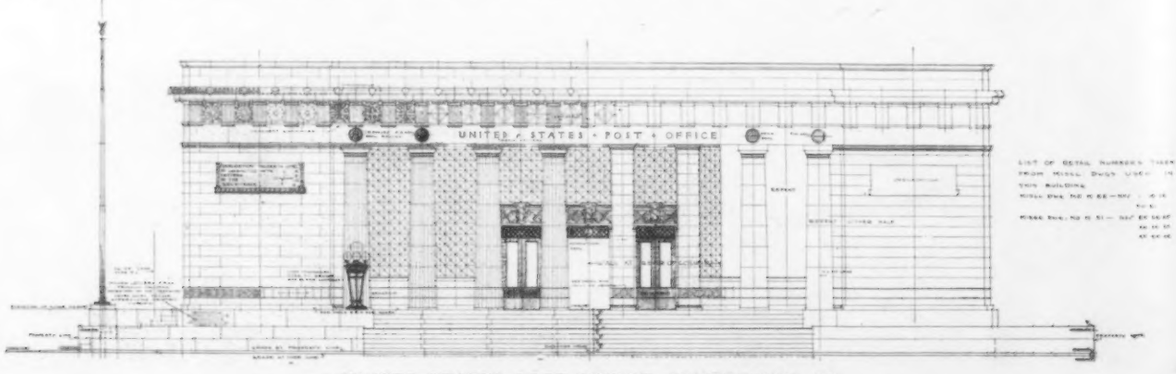
800 ..... Architectural shop drawings.
900 ..... Structural shop drawings.
1000 ..... Mechanical shop drawings.

Where a sheet represents work to be done by more than one trade, the number given to it is governed by the predominating trade.

This system of numbering has many advantages; up to quite recently I have been numbering drawings consecutively as made, whatever their class or character; but I find certain drawbacks to this. The original idea was, that the full sizes (let us say) relating to a certain scale drawing would be finished up at about the same time as the latter, and if not, very soon thereafter, and numbers could be reserved for these full sizes so that they could be bound in consecutively and follow, in the set, the scale drawings, and cross reference be made easy. But it is not always convenient, advisable, or desirable to make the full sizes (or to assemble them on the final sheet — see BRICKBUILDER for May, 1913) at once, and the original idea cannot be carried out and so becomes practically worthless. Moreover, for any large job, the set should be subdivided or it becomes unwieldy and troublesome to handle. I am going to adopt the principle of numbering given above.

The method of placing the drawings on a sheet is not subject to a fixed rule in the Supervising Architect's office. When tracings are printed to be issued to bidders, a set of the prints is bound together and placed in a drawer in the custody of the draftsman in charge of that particular building. The theory is that any change made as the execution of the work proceeds at the site is noted on the drawing, so that when the building is completed this set shows exactly the work as in place. After the building is occupied the drawings are forwarded to a general file. In issuing plans and specifications to bidders a multiple form is used which gives a complete record of the transaction from beginning to end, and reduces the correspondence. As a general rule, each contractor is allowed fifteen sets of scale drawings and specifications, and one copy each of full size drawings, except in the case of standard details, when three copies are sent. The contract drawings contain a fair proportion of ¾ scale details to illustrate the work, and after a contract is awarded the full size details furnished the contractor are quite complete; possibly more so than in a private office, as the work of the Supervising Architect's office is often done at long range.

In these papers I have of course only scratched the surface; they are intended to be suggestive, not didactic, and if they will have really suggested something of interest to some one, they will have served their modest purpose.



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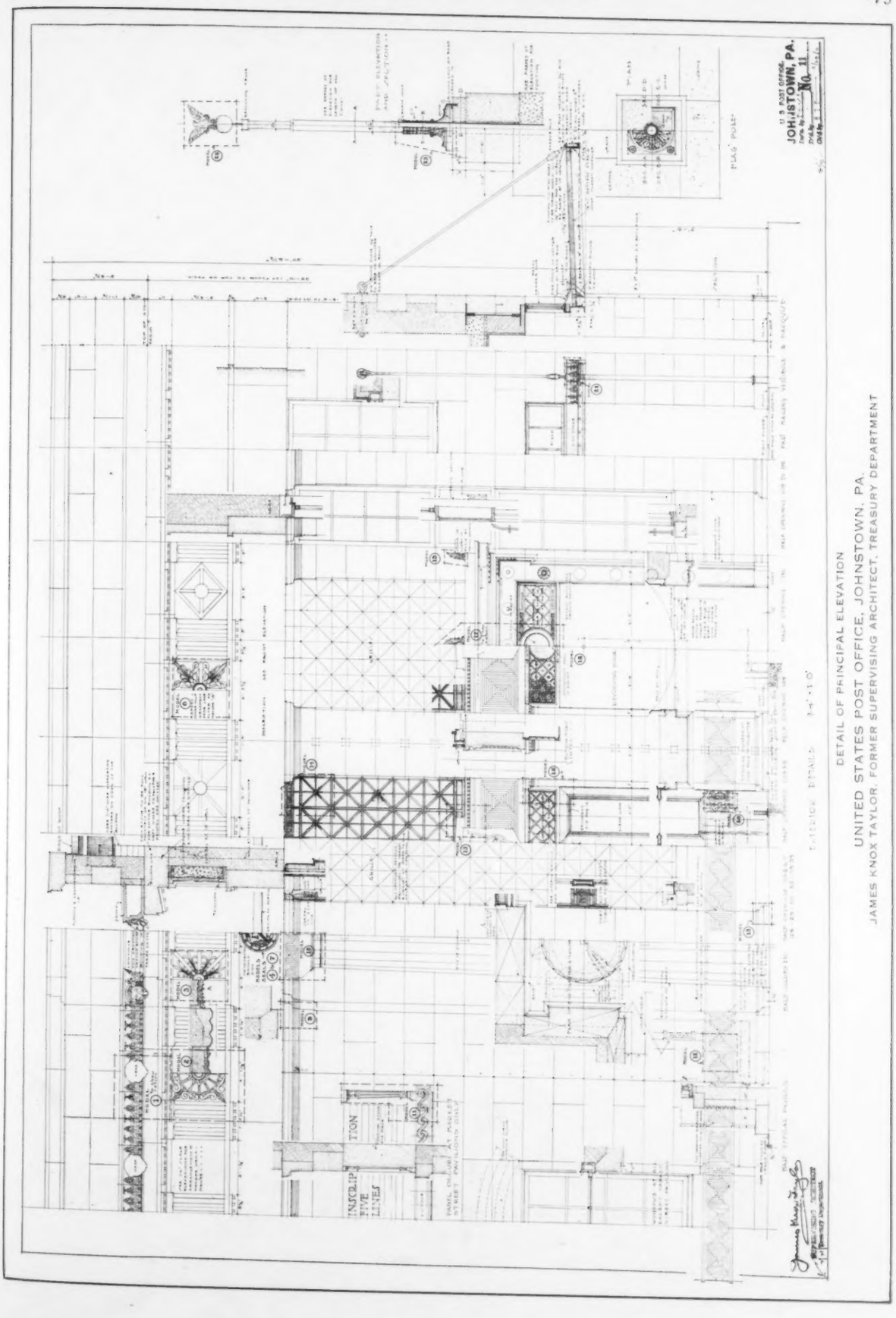
JAMES KNOX TAYLOR, FORMER SUPERVISING ARCHITECT, TREASURY DEPARTMENT.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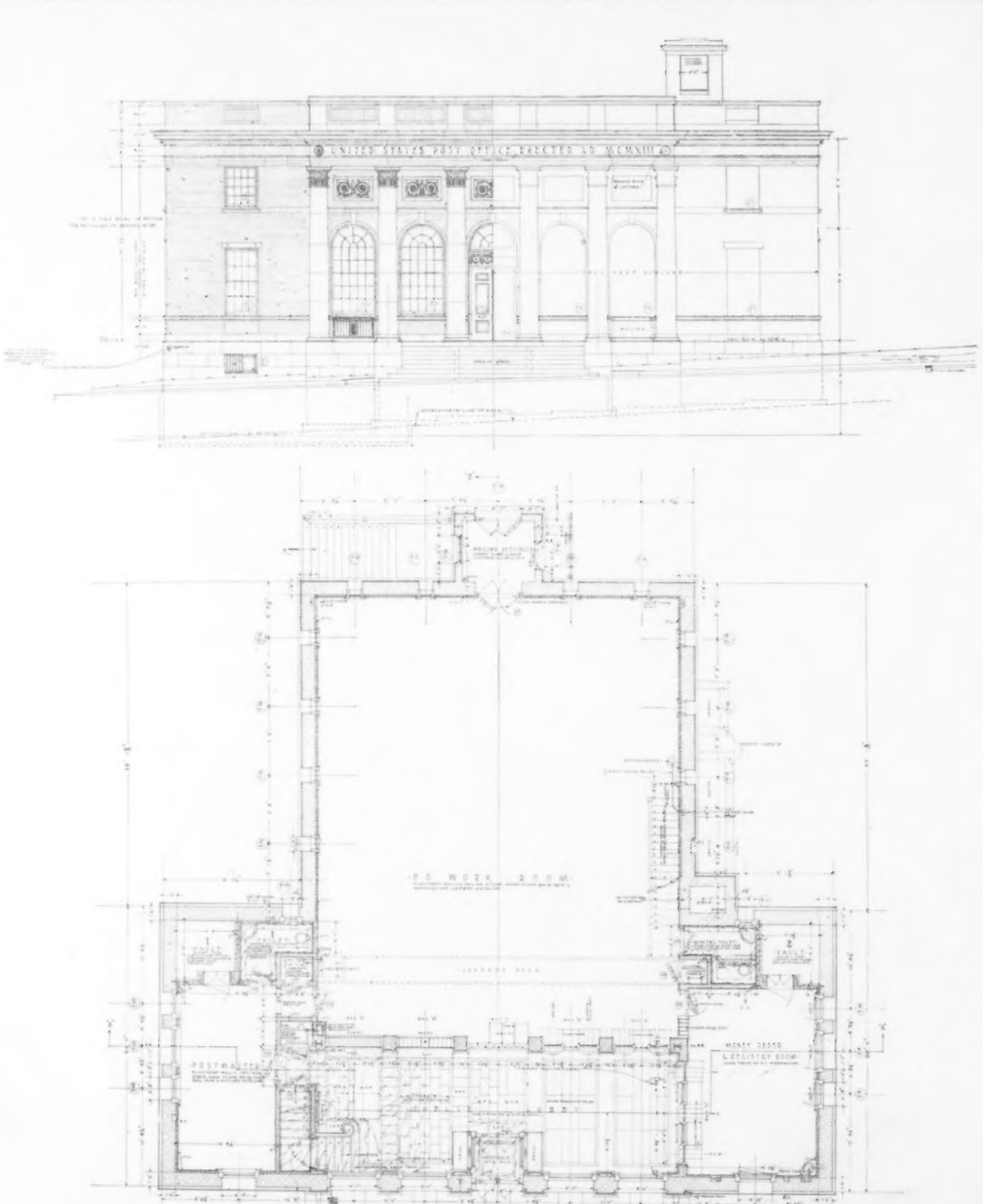
JOHNSTOWN, PA.
No. 11
FLAG POLE
DETAIL OF PRINCIPAL ELEVATION
UNITED STATES POST OFFICE, JOHNSTOWN, PA.
JAMES KNOX TAYLOR, FORMER SUPERVISING ARCHITECT, TREASURY DEPARTMENT



PRINCIPAL ELEVATION AND FIRST FLOOR PLAN

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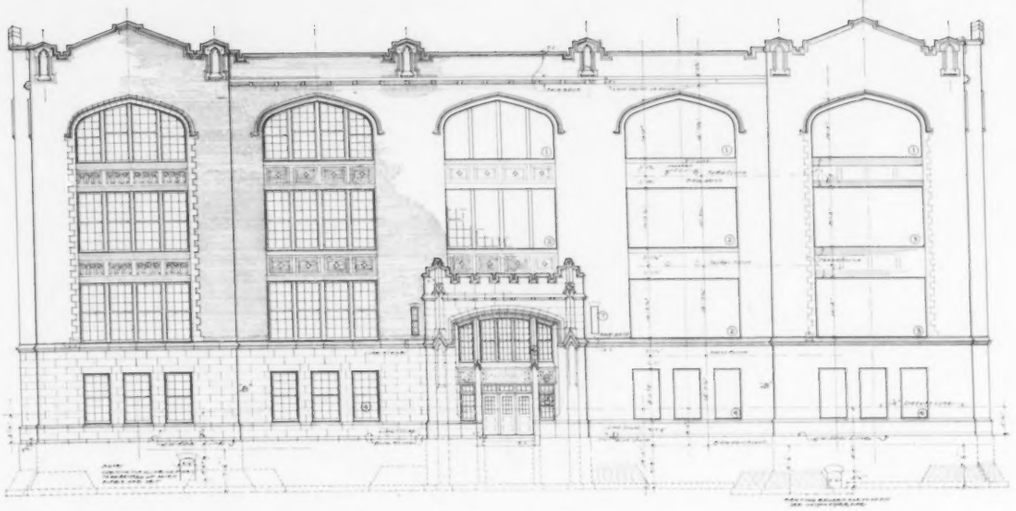
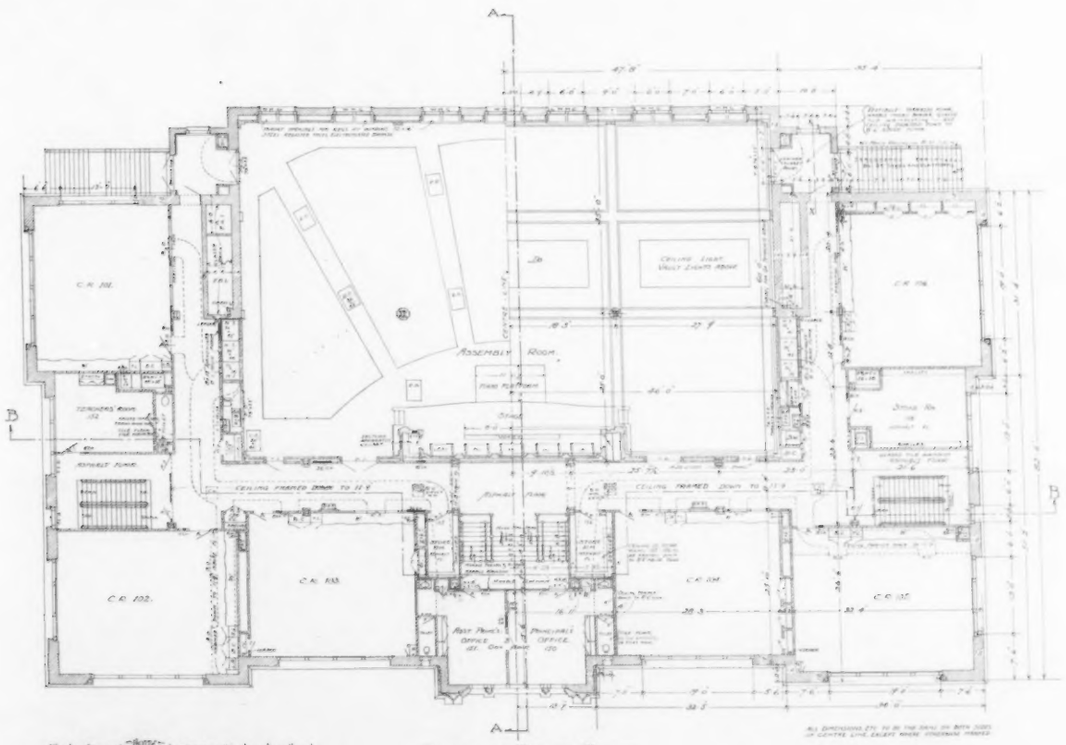
OSCAR WENDEROTH, SUPERVISING ARCHITECT, TREASURY DEPARTMENT



FRONT ELEVATION

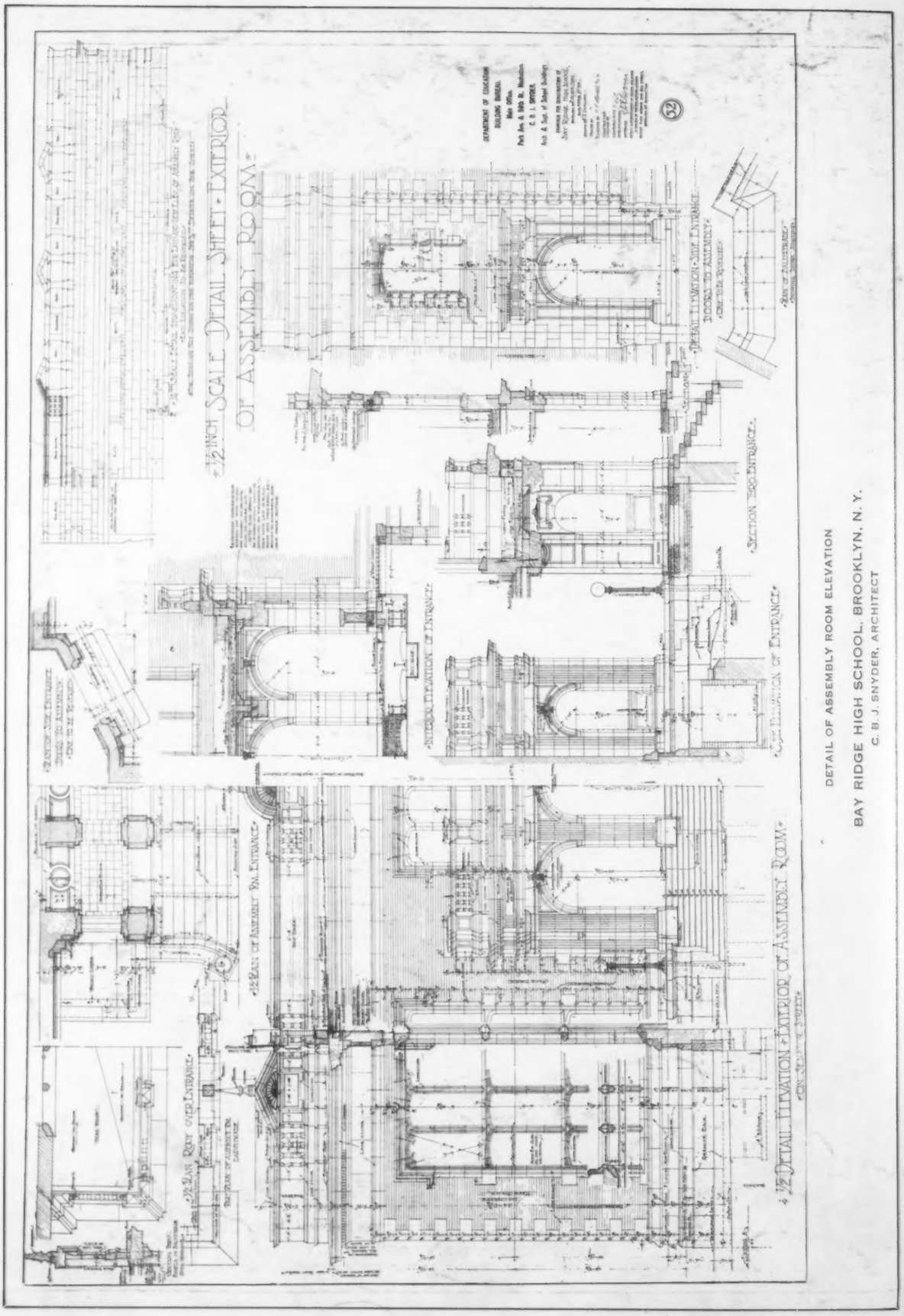


PLAN OF FIRST FLOOR
SCALE 1/8"-1'-0"

PRINCIPAL ELEVATION AND FIRST FLOOR PLAN

PUBLIC SCHOOL 172, BROOKLYN, N.Y.

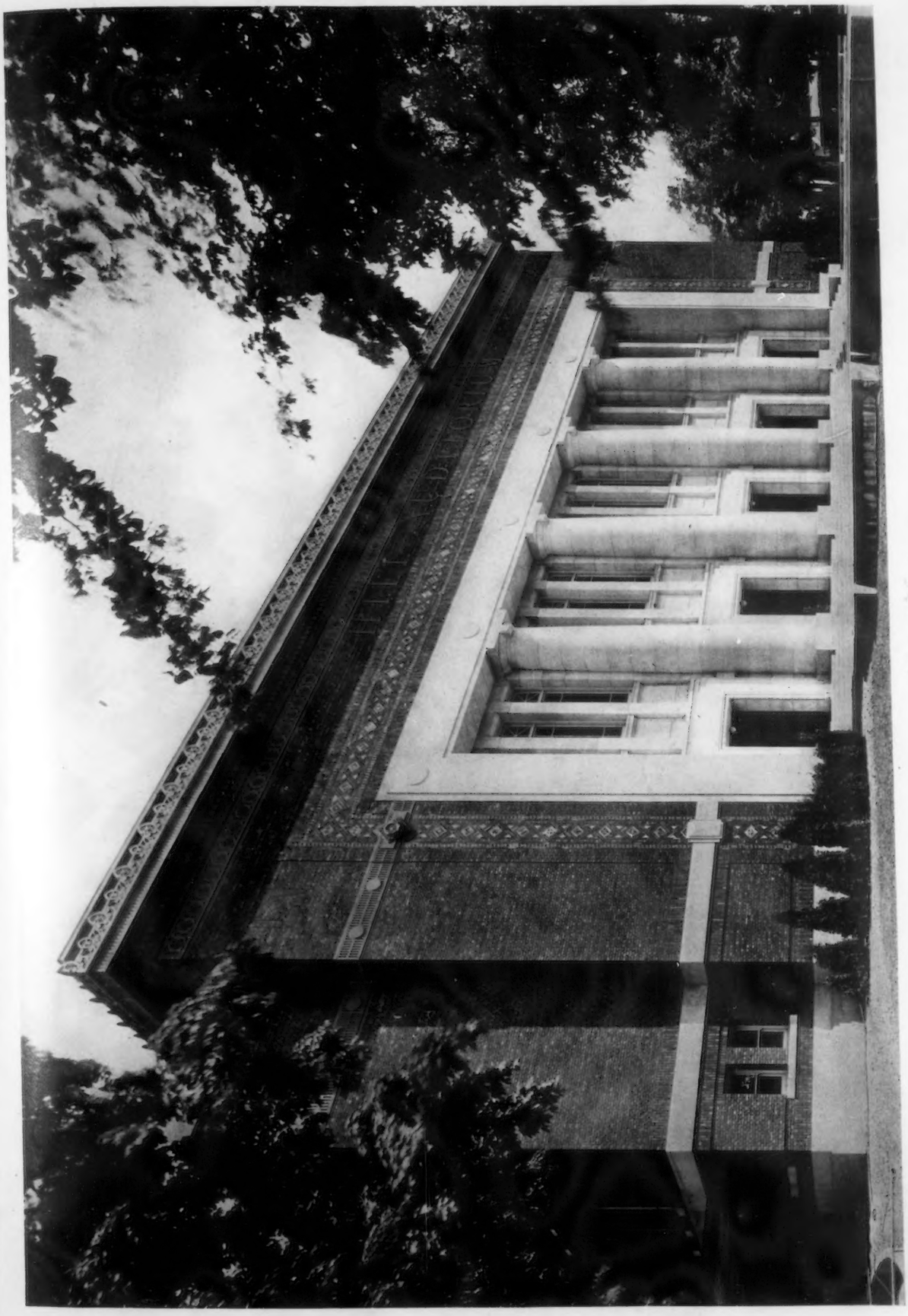
C. B. J. SNYDER, ARCHITECT


½ Inch Scale Detail Sheet - Exterior of Assembly Room
½ Detail Elevation - Exterior of Assembly Room
Detail Elevation - Side Entrance
Section Thro Entrance
Interior Elevation of Entrance
Exterior Elevation of Entrance
Plan of Assembly Rm. Entrance
Plan Roof over Entrance
Department of Education
Building Bureau
Main Office
Post Jan. 4, 1905 St. Manhattan
C. B. J. SNYDER
Architect & Supt. of School Buildings
32

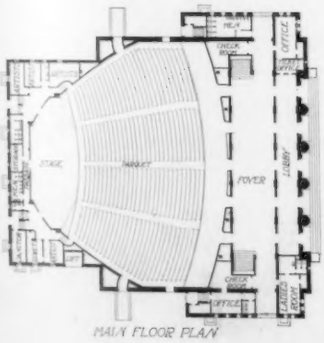
DETAIL OF ASSEMBLY ROOM ELEVATION

BAY RIDGE HIGH SCHOOL, BROOKLYN, N. Y.

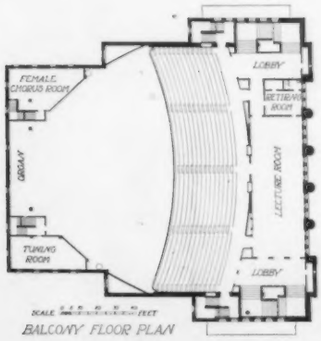
C. B. J. SNYDER, ARCHITECT



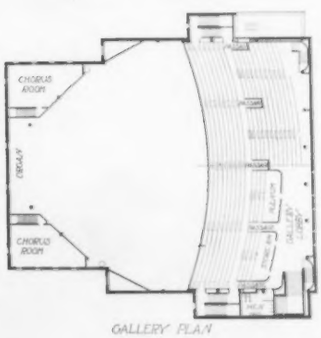
THE HILL MEMORIAL AUDITORIUM, ANN ARBOR, MICH.
ALBERT KAHN, ARCHITECT. ERNEST WILBY, ASSOCIATE



MAIN FLOOR PLAN

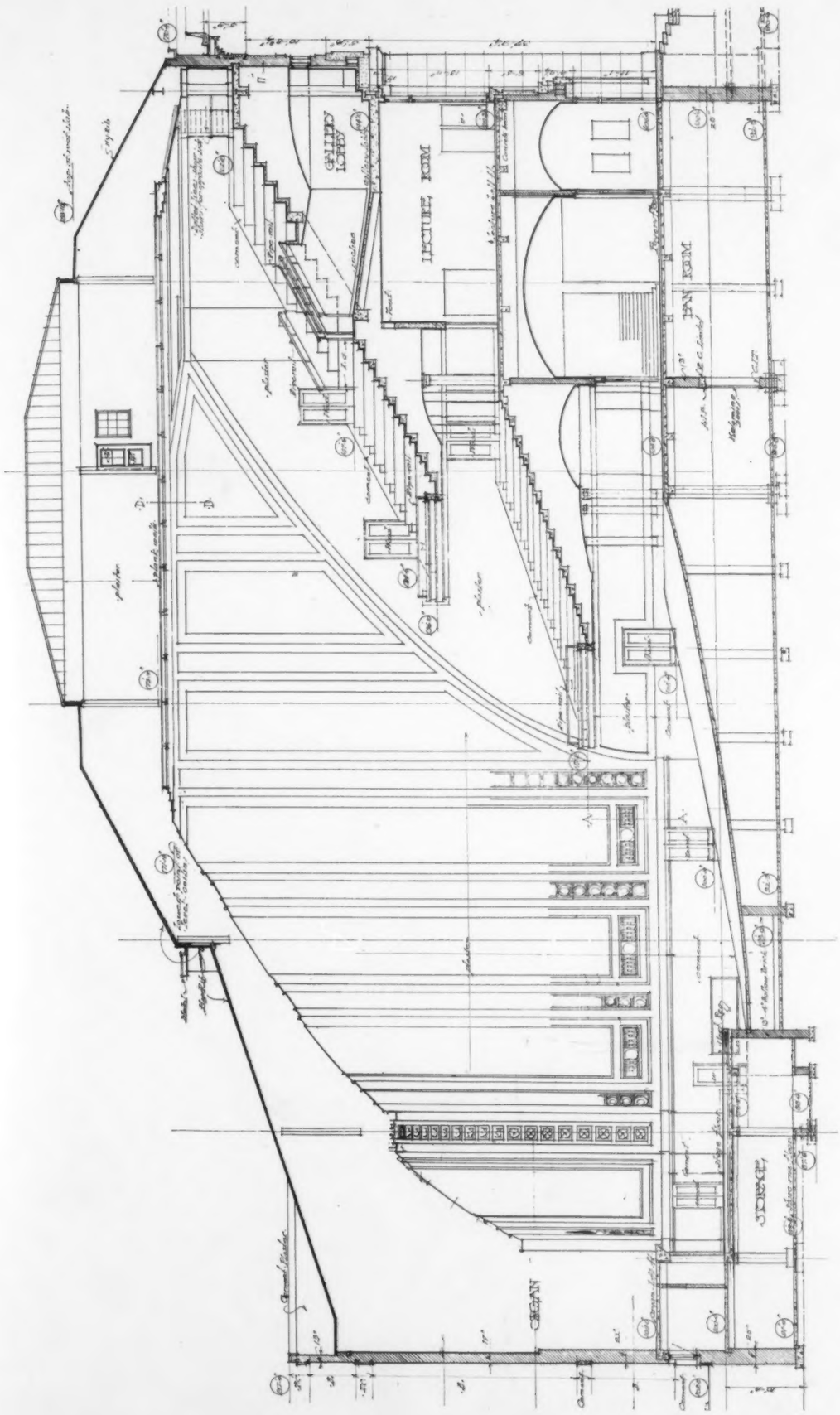


BALCONY FLOOR PLAN



GALLERY PLAN

THE HILL MEMORIAL AUDITORIUM, ANN ARBOR, MICH.
ALBERT KAHN, ARCHITECT: ERNEST WILBY, ASSOCIATE

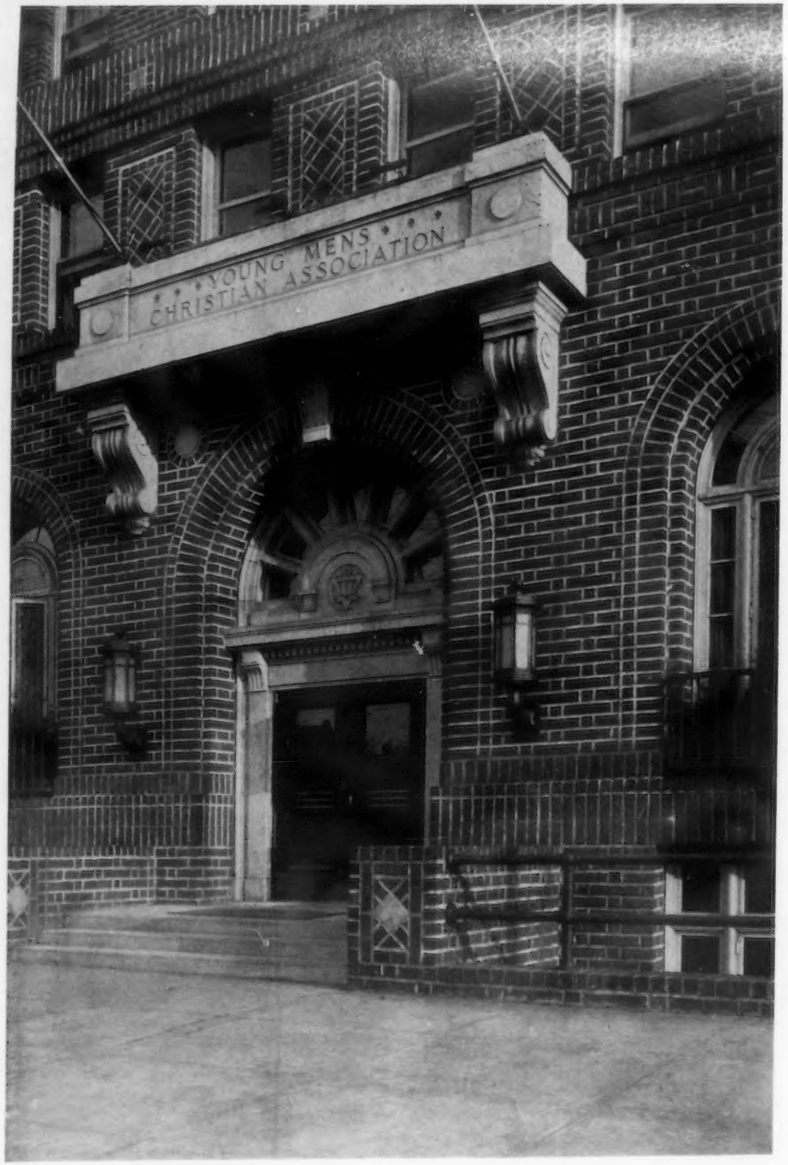


LONGITUDINAL SECTION ON LINE A-A

SCALE: 1/8" = 1'-0"

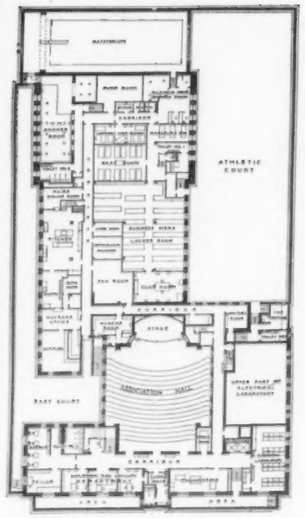
THE HILL MEMORIAL AUDITORIUM, ANN ARBOR, MICH.
ALBERT KAHN, ARCHITECT; ERNEST WILBY, ASSOCIATE

Y. M. C. A. BUILDING, CLEVELAND, OHIO
HUBBELL & BENES ARCHITECTS

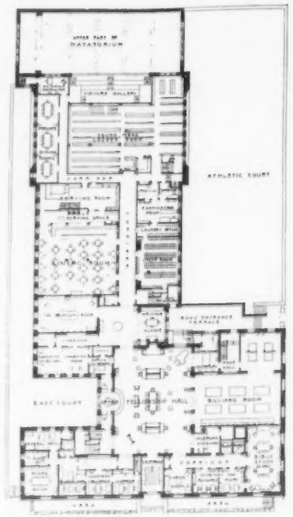


ENTRANCE DETAIL

REAR AND GYMNASIUM



BASEMENT



FIRST FLOOR

SECOND FLOOR

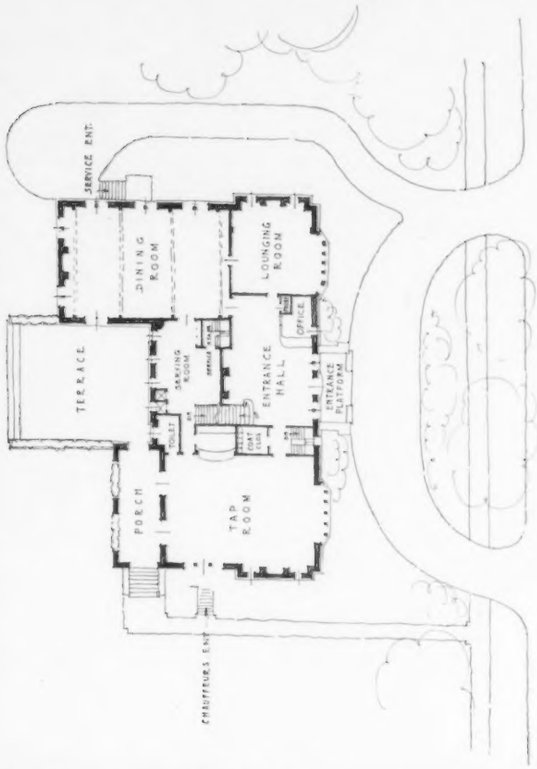
Y. M. C. A. BUILDING, CLEVELAND, OHIO
HUBBELL & BENES, ARCHITECTS

GENERAL VIEW FROM RACE TRACK

VIEW FROM DRIVE

THE GOSHEN INN, GOSHEN, N. Y.
WALKER & GILLETTE, ARCHITECTS

GENERAL VIEW FROM STREET



PLAN

ENTRANCE DETAIL

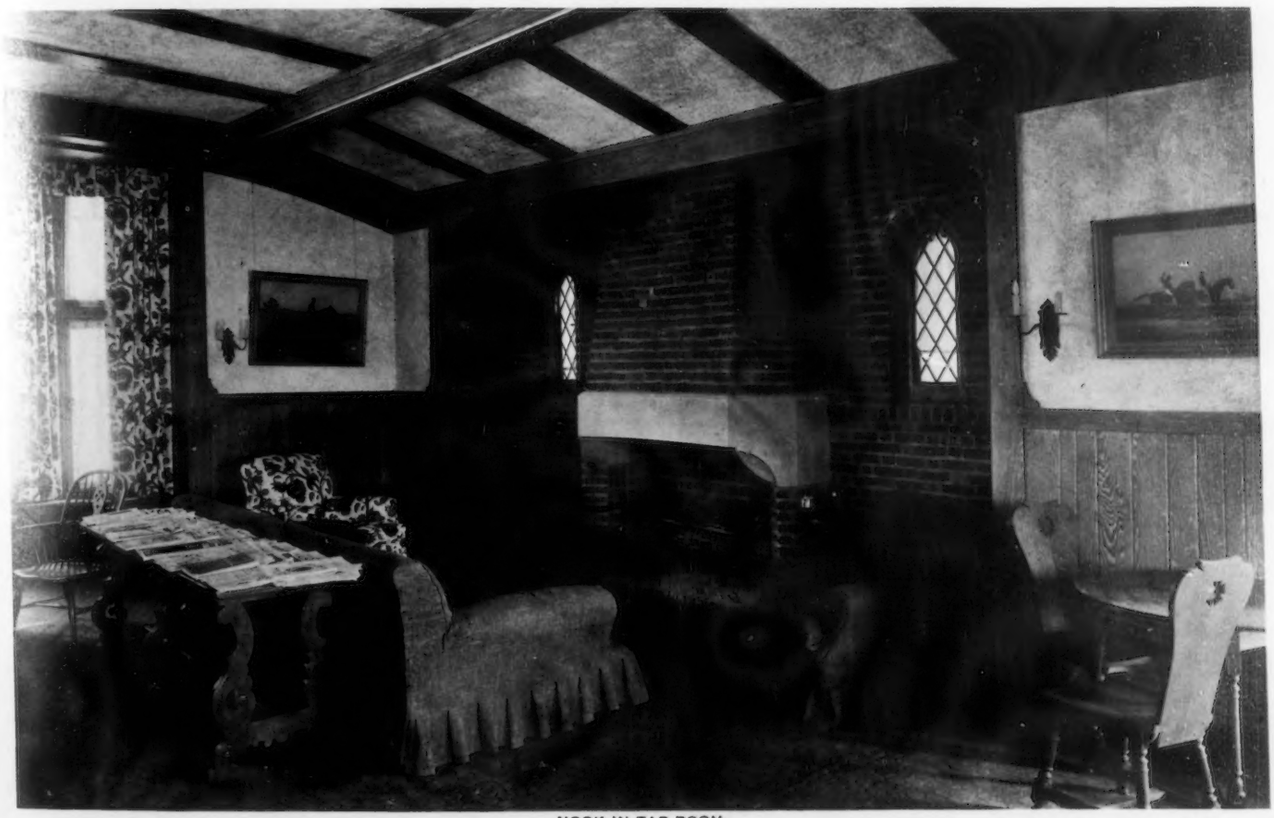
THE GOSHEN INN, GOSHEN, N. Y.
WALKER & GILLETTE, ARCHITECTS

DINING ROOM

ENTRANCE HALL

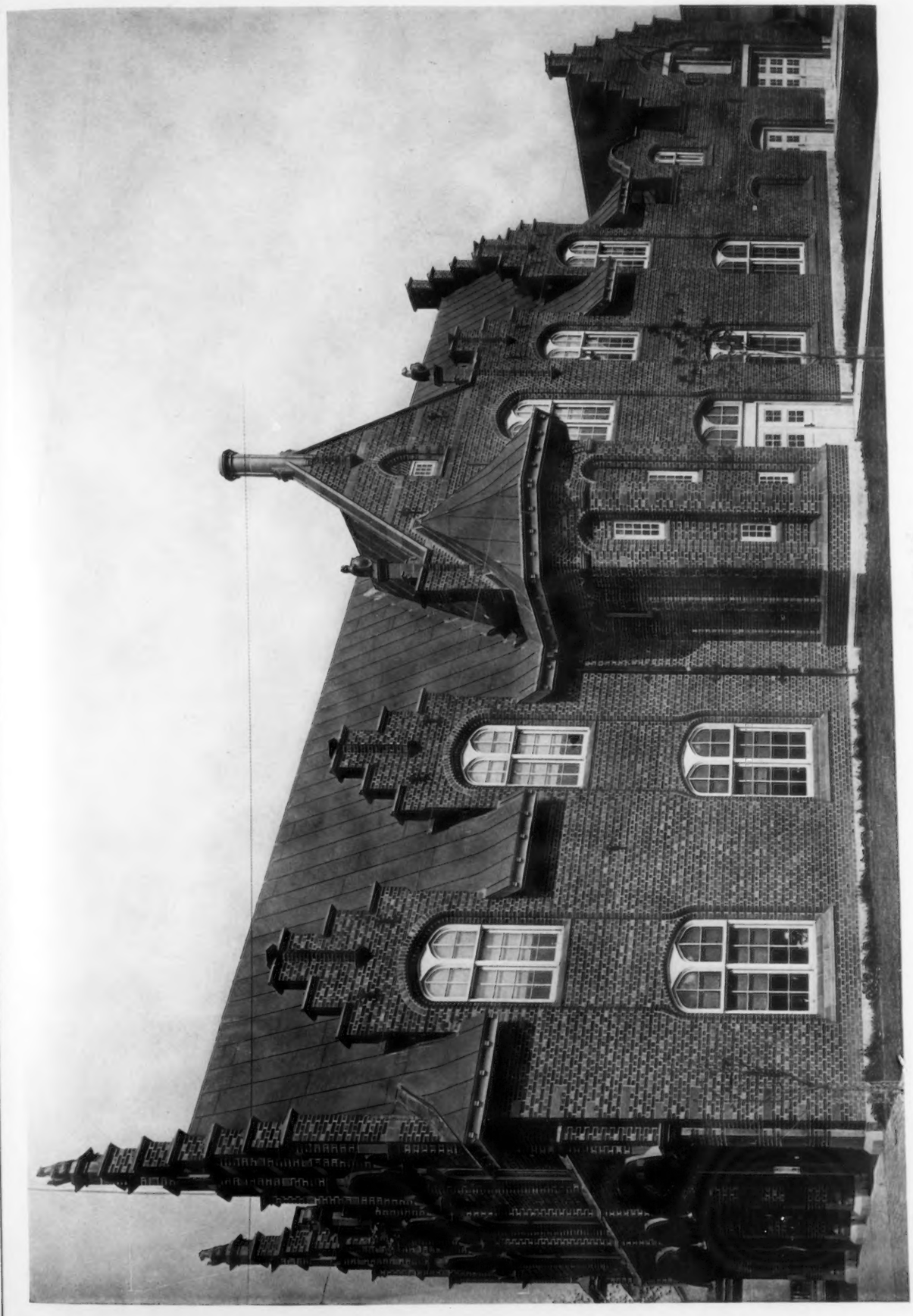
THE GOSHEN INN, GOSHEN, N. Y.
WALKER & GILLETTE, ARCHITECTS

TAP ROOM

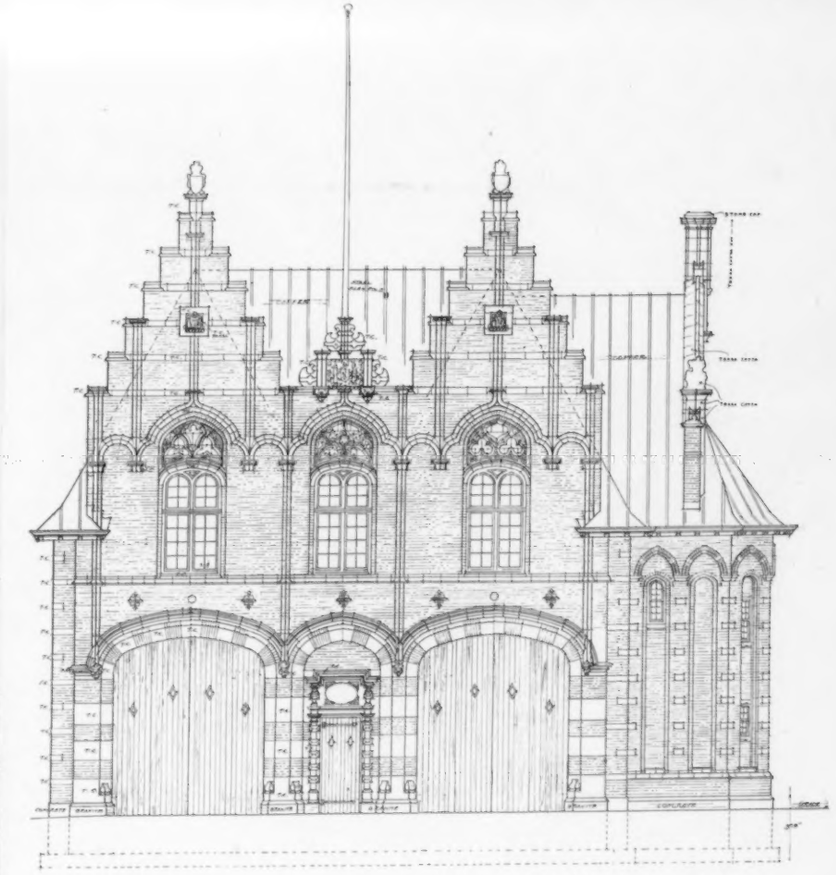


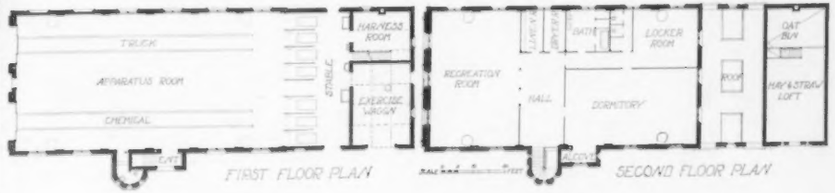
NOOK IN TAP ROOM

THE GOSHEN INN, GOSHEN, N. Y.
WALKER & GILLETTE, ARCHITECTS

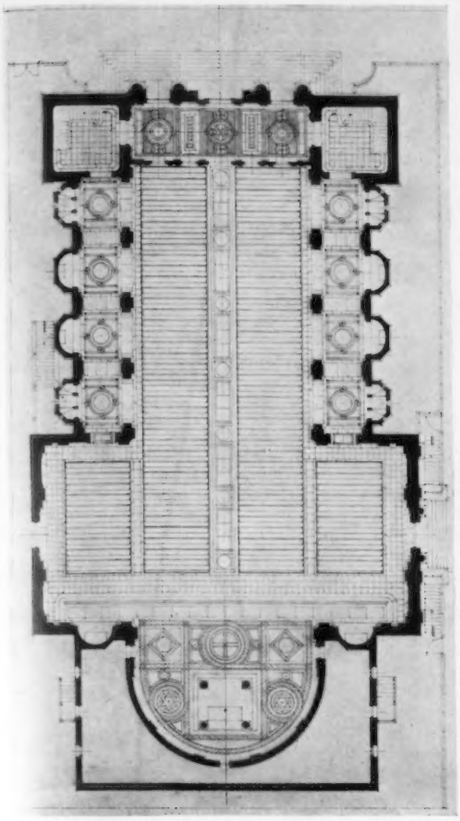


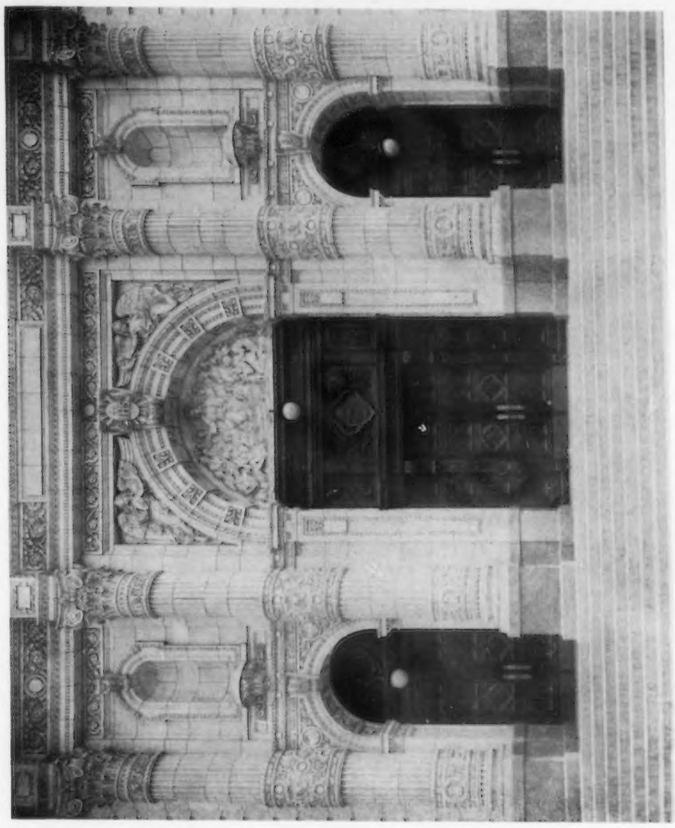
FIRE HOUSE, ALBANY, NEW YORK
MARCUS T. REYNOLDS, ARCHITECT





FIRE HOUSE, ALBANY, NEW YORK
MARCUS T REYNOLDS, ARCHITECT

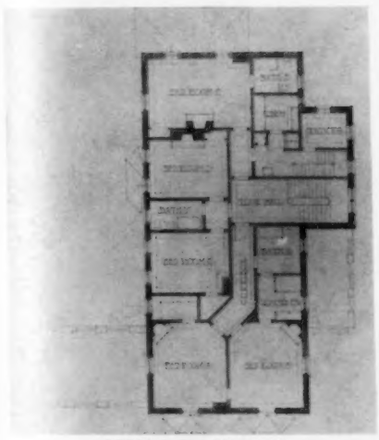




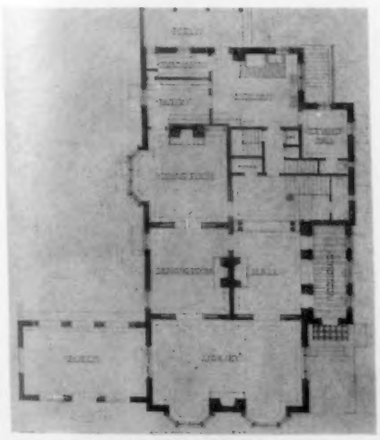
ST. BARBARA'S CHURCH, BROOKLYN, N. Y.
HELME & HUBERTY, ARCHITECTS

HOUSE AT BALTIMORE, MARYLAND
LAURENCE HALL FOWLER, ARCHITECT

REAR VIEW



SECOND FLOOR PLAN



FIRST FLOOR PLAN

DETAIL OF END GABLE

HOUSE AT BALTIMORE, MARYLAND
LAURENCE HALL FOWLER, ARCHITECT

DINING ROOM

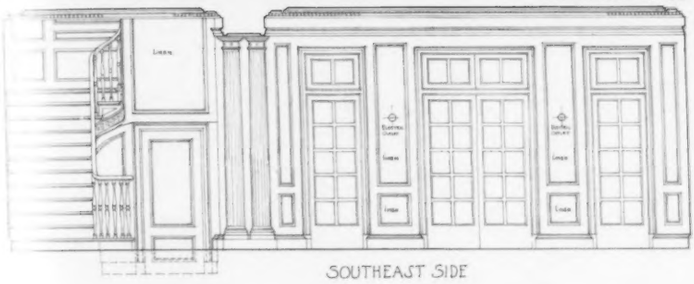
DETAILS OF DINING ROOM

GARDEN

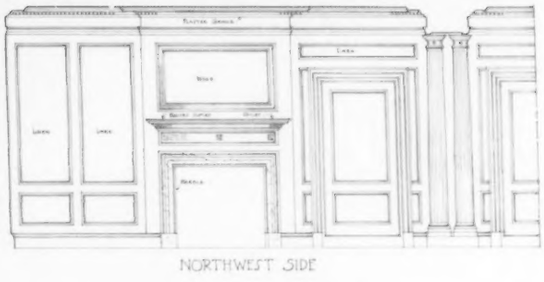
LIBRARY

HOUSE AT BALTIMORE, MARYLAND
LAURENCE HALL FOWLER, ARCHITECT

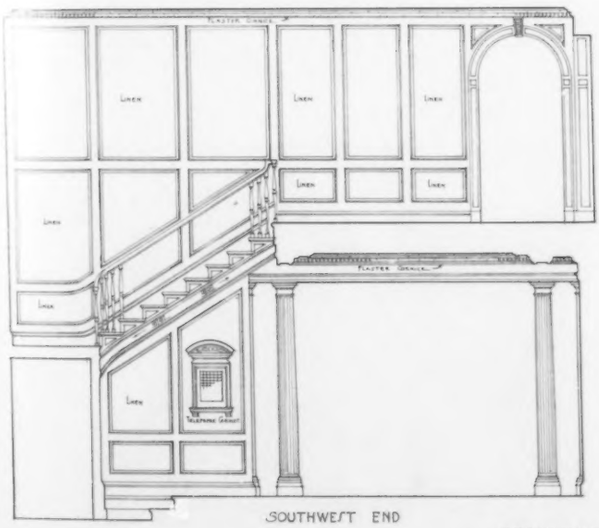
ENTRANCE HALL



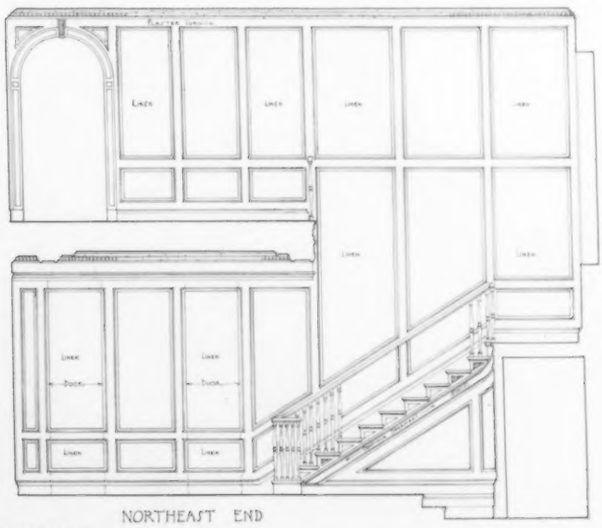
SOUTHEAST SIDE



NORTHWEST SIDE



SOUTHWEST END



NORTHEAST END

DETAILS OF ENTRANCE HALL

HOUSE AT BALTIMORE, MARYLAND

LAURENCE HALL FOWLER, ARCHITECT

The Business Side of an Architect's Office.

WITH A DESCRIPTION OF THE ARCHITECTS' BUILDING, NEW YORK.

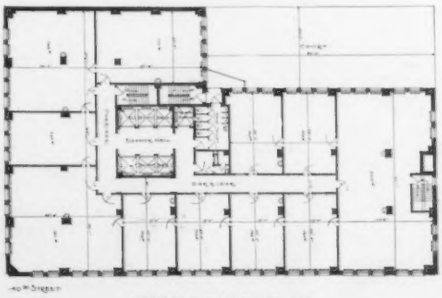
BY D. EVERETT WAID.

WE propose to illustrate in this series of articles the offices of a number of noted architects. Plans and photographs will be presented and also descriptions of salient features of each. Architects are invited to write to Mr. D. E. Waid, 1 Madison Avenue, New York, who will be interested to learn of any office devices, methods, or printed forms which they have found valuable in their office management and which might be of general interest to the profession.

ONE Hundred and One Park Avenue, New York City, has been christened "The Architects' Building." It is one of the buildings completed this year which most assuredly has an unique interest to every one in the architectural profession. The attention of the building world has been attracted because it was built as the home of a large group of T square and triangle men; it was designed by them and is owned by them. Already some twenty-five architects and engineers have collected under this one roof. One Hundred and One Park Avenue is theirs, and it will be interesting to follow the method by which the scheme of co-operative offices was handled among so many and in a city where there is so much competition and such great activity in building. The fact that the building has accommodations for general and sub-contractors, decorators, material men, etc., would indicate a greater efficiency in handling the working forces of those who are fortunate enough to be numbered as tenants. One's office boy, with a tracing, can disappear into an elevator and in ten minutes bring back a blueprint hot and dry from an electrically lighted cylinder. Sets of drawings can be most conveniently delivered to contractors, and that contractor, called General, can quietly tap at the door and delicately insinuate that if F. S. details are not ready by such a date, the time of completion of the building will have to be extended. It seems quite ideal to be able to go next door for a criticism, or to borrow a draftsman, or to admire a set of competition drawings.

One Hundred and One Park Avenue is interesting to the architectural profession because here its members can see the offices of several distinguished architects designed by themselves and undoubtedly expressive to a large degree of the taste and character of each. The building is interesting to the building world in general, because here the architects were their own clients and presumably handled the whole enterprise in an ideal way from the architects' point of view — from the purchase of the ground to the solution of the office building problem, and finally, in the letting of contracts and execution of the work.

PARK AVENUE FAÇADE.



TYPICAL FLOOR PLAN.

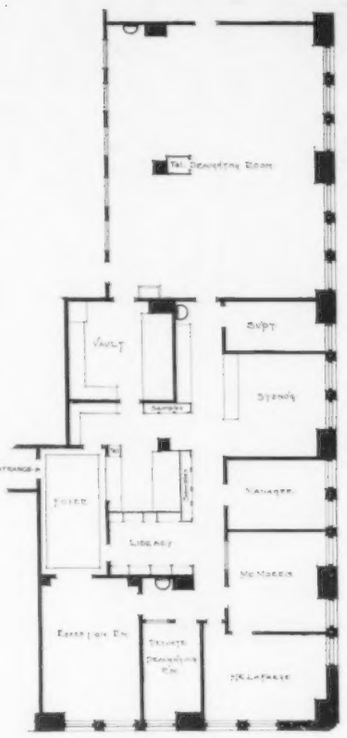
THE ARCHITECTS' BUILDING, NEW YORK CITY.
Ewing & Chappell, La Farge & Morris,
Associated Architects.

The real history of the enterprise is quite as interesting as one's fancy could wish. The scheme of co-operative offices for architects had been suggested by Charles Ewing seven years before, and, at that time, with the encouragement of John M. Carrère and others, had almost been realized. Now all signs seemed propitious. Mr. Mead gave strong support to the idea, and, with Ewing & Chappell and La Farge & Morris as the active leaders, it quickly assumed definite form. Mr. Burt L. Fenner, as president, headed a stock company composed of fifteen architects and seven engineers.

After a long search for a site one was finally selected, excellent as to its proximity to a great transportation center, the lot chosen being on the corner of Park Avenue and Fortieth Street, two short blocks from the new Grand Central Terminal. The building obtains a south and west frontage. This we may label surprise number one. In the outcome, however, considering the north court light for those who wish it, the long, sunny, breezy south front is voted altogether fortunate.

The financing scheme having been worked out, several general contractors were called upon for estimates. But they couldn't bring the cost down to fit the finances. Speculative builders have constructed the larger part of New York, and they came to the rescue in this case — surprise number two. A firm of builders who had begun with modest tenements and crowned their success as expert buyers of ground and labor and building materials for great hotels

and commercial buildings, agreed to furnish our group of architects with both land and building ready for use. A two million dollar bargain was struck over sketch plans and outline specifications. It was agreed by preliminary contract, June, 1912, that working drawings and specifications were to be developed by a certain date, and then, if minds shouldn't meet in design upon one side against price on the other, either party to the contract could withdraw. The preliminaries proved true and the contract was confirmed July 10, 1912, for the completion of the building May 1, 1913. As a matter of fact, the first tenant moved in April 3, 1913, and the building was *really* completed May 1, 1913 — surprise number three. The builders furnished ground and building and procured a first mortgage cash loan and gave a second purchase money mortgage. The architects paid cash for their stock and thus completed the financial deed which made the property theirs. The amount of stock allotted to each bore no absolute relation to the office space desired by each, although the limit of subscription ranged from three to five dollars per foot. But the largest subscriber had first choice of space, and so on. Each subscriber takes a lease like any other tenant at the average price, $1.75 per square foot. His advantage is expected to accrue in the form of dividends which may cover his capital at the rate of five per cent the first year, and, if all goes well, may reduce his rent one-half later on. A special sinking fund is provided to pay off the second mortgage in ten years and a substantial sum, $20,000, in addition, goes annually into a general sinking fund.



PLAN.
OFFICE OF LA FARGE & MORRIS.

The structure has a basement and sixteen stories, with provision for four additional stories. It complies with the law for "loft" or light manufacturing buildings as to floor loads (one hundred and twenty pounds) and as to exits. The three stairways afford evenly distributed fire-protected exits from each story, and are in fact equal in value to five stairways placed in the ordinary fashion. Other ingenuities of plan also are evident and are accomplished in a simple way which gives flexibility as to subdivision highly commendable both from commercial and fire protection standpoints. The typical stories are 12 feet high in the clear instead of the usual 10 feet, and windows placed close to the ceiling give good light even to the rear of 29-foot rooms. In this connection it may be well for architects to recall that drafting tables 32 inches high are better illuminated under the same daylight conditions than tables 42 inches high.

The frame of the building is steel, carrying all walls story by story and reinforced concrete floor slabs with a span of about five feet. The finished floors are concrete with surfaces hardened by the oxidized iron filings process. Each tenant, however, is likely to have a part, at least, of his floors covered with linoleum or some plastic composition. The regular base is of slate, five inches high, and there is a wide border of slate to support radiators and cover their branches. Window frames and sashes are of hollow sheet steel with no inside trim save plaster jambs and slate stools.

The corridor floors are of terrazzo. This material, objectionable because of the tendency of shedding its feather-edged chips of marble and leaving a pitted surface and because of its future zigzag shrinkage cracks, is yet attractive in appearance. It is laid in panels with mosaic borders on the beam lines. The corridor base is Tennessee marble, eight inches high. The critical visitor should know that the owners fully and regretfully realized that, in economizing on plaster wainscot in corridors and omitting marble, they were incurring an increased maintenance cost.

The material used for the first two stories of the building is limestone. The entire shaft of the building is built of brick. Brick lintels have been used without any embellishment, the only break in the plain surfaces being at the fourteenth floor, where a terra cotta sill course runs around the two street façades. A terra cotta cornice with slight projection crowns the upper stories. The building expresses frankly that it is to be used for offices where maximum light is the chief requirement. The design does not conceal the fact that the framework is steel. The corner piers, however, express a certain amount of strength which adds to the pleasingness of the composition.

RECEPTION ROOM.
OFFICE OF LA FARGE & MORRIS.

DRAFTING ROOM.

PLAN.

OFFICE OF EWING & CHAPPELL.

MR. EWING'S PRIVATE OFFICE.

We illustrate herewith plans and several photographs showing the individual offices of the two firms who promoted and designed the building. The plans show the possibilities of layout where the conditions are absolutely favorable. The architects in each case subdivided the space allotted them, always keeping in mind relative importance of space for drafting room, reception room, library, filing, etc., as to insure efficient administration.

It will be noted that special attention has been given in both the offices shown to the matter of office entrances and the control of these. The operator of the telephone switchboard is in a position to direct all visitors to the proper department, quickly sending clients one way and contractors another and, at the same time, can issue and receive drawings and is the better able to do all the useful things which are expected of that functionary.

Messrs. La Farge & Morris have collected and placed in their reception room several bits of interesting oriental carving, rugs, etc., the rich coloring of which is suggested by our photograph. The walls are covered with burlap painted a dark green. The color scheme in all other portions of the office is in a light cream or buff. Besides the private offices for the members of the firm it will be noted that provision has been made for an office manager and superintendent. A vault large enough to serve as a filing room is a feature of this office. It is accessible from the main office and drafting room.

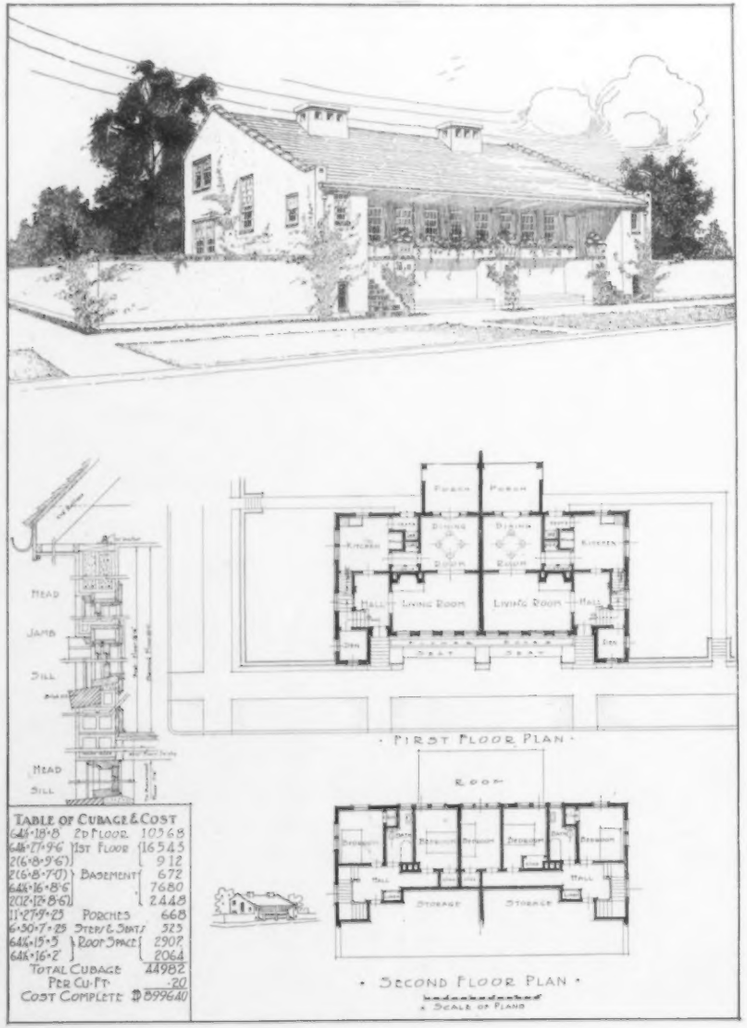
The lobby and reception rooms of Ewing & Chappell are light gray and white in a simple and pleasing treatment. The panels of the wainscot are nearly white canvas applied to the walls, overlaid with stiles and rails of plain gray wood. The coat room has hangers on metal rods set at right angles to the wall with individual hat pigeon holes above. In the drafting room, a horizontal bar is hung on curtain pulleys and travels from floor to ceiling in hoisting detail drawings for judgment.

One device which Mr. Ewing recommends to his interested visitor is a bunch of blank cards which are kept within reach for a memorandum record of first interviews with clients. These cards are larger than a letter sheet and have printed down the left margin a list of items suggesting questions which always need to be asked at the outset of any commission to give a clear understanding of the problem in hand.

RECEPTION ROOM.

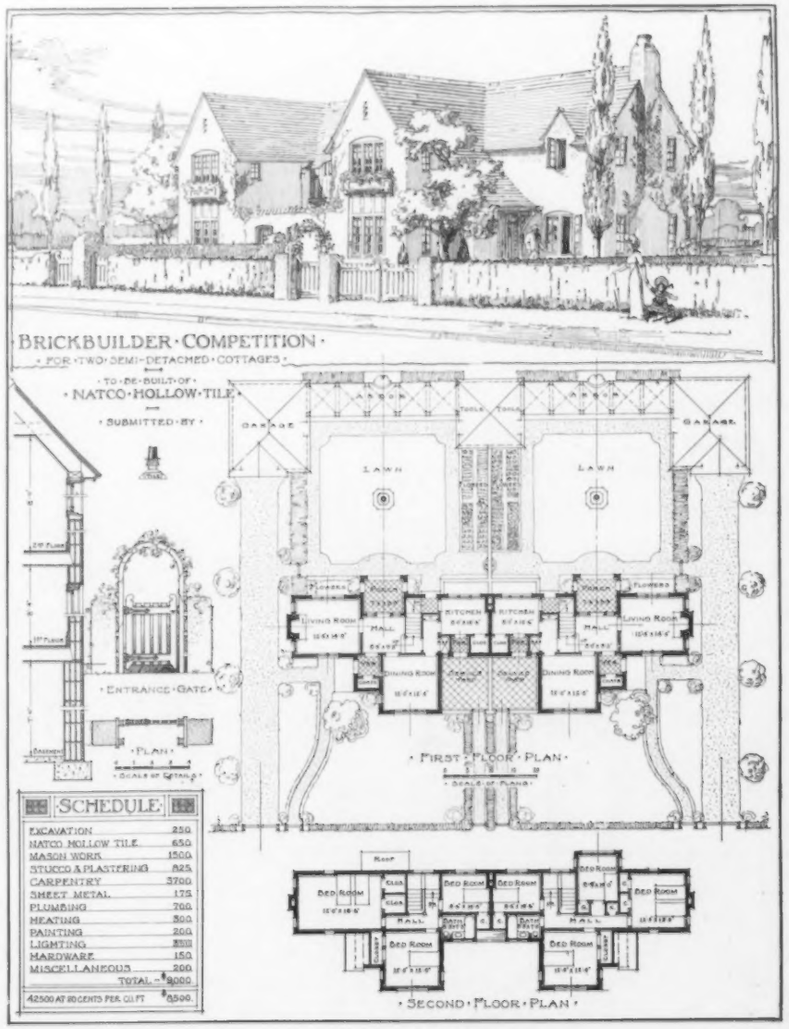
OFFICE OF EWING & CHAPPELL.

These two offices which we have considered are an interesting study, not because they are larger than those occupied by the average architect, but because being newly planned by their owners after a long experience in building up and organizing a successful professional practice, they represent what has been found to be the most economical and efficient arrangement of the various parts making up the business side of an architect's office.



FIRST PRIZE DESIGN

SUBMITTED BY HERBERT A. SULLWOLD
ST. PAUL, MINN.



SECOND PRIZE DESIGN

SUBMITTED BY JOHN ALMY TOMPKINS, 2D, AND HARRY BRODSKY
NEW YORK, N. Y.

Competition for Two Semi-Detached Cottages.

TO BE BUILT OF HOLLOW TILE.

Program Governing the Competition.

THE problem calls for Two Small Semi-Detached Cottages — two dwellings under a single roof, separated by a party wall — the walls and foundations of which are to be built of Hollow Tile. Competitors may group the two cottages in any manner they see fit — originality in this respect is sought after.

The location may be assumed in a town, small city, or suburb of a large city. Size and shape of plot to be established arbitrarily by the designer — the land is level.

Each cottage may have two or three floors — above foundation.

One cottage is to provide living accommodations for a family of two adults and two children, and the other, accommodations for a family of three adults and two children.

The cost of these two semi-detached cottages — exclusive of the land — shall not exceed $9,000. The method of heating and plumbing, other fixtures and finish, to be governed by the limit of cost.

The cost of these cottages must be figured at $.20 per cubic foot. Measurements of the cottages must be taken from the outside face of exterior walls and from the level of basement floor to the average height of all roofs. Porches, verandas, and other additions are to be figured separately at one-fourth (25%) of their total cubage. The cost of porches, etc., is to be included in the total cost of the two cottages ($9,000).

All cubage and other dimensions will be carefully checked before the drawings are submitted to the jury.

The jury will not consider those designs which exceed the limit of cost.

The jury will give first consideration to the fitness of the design, in an æsthetic sense, to the material employed; second — the adaptability of the design, as shown by the details, to the practical constructive requirements of the material; third — excellence of plans.

Drawings which do not meet the requirements of the program will not be considered.

On the drawing in a space measuring 6 inches by 5 inches — enclosed in rules — is to be given, at a size which will permit of three-quarters reduction, the cubage of the cottages multiplied by the cost per cubic foot, and the various items with costs which go to make up the total cost of the cottages.

Report of the Jury of Award.

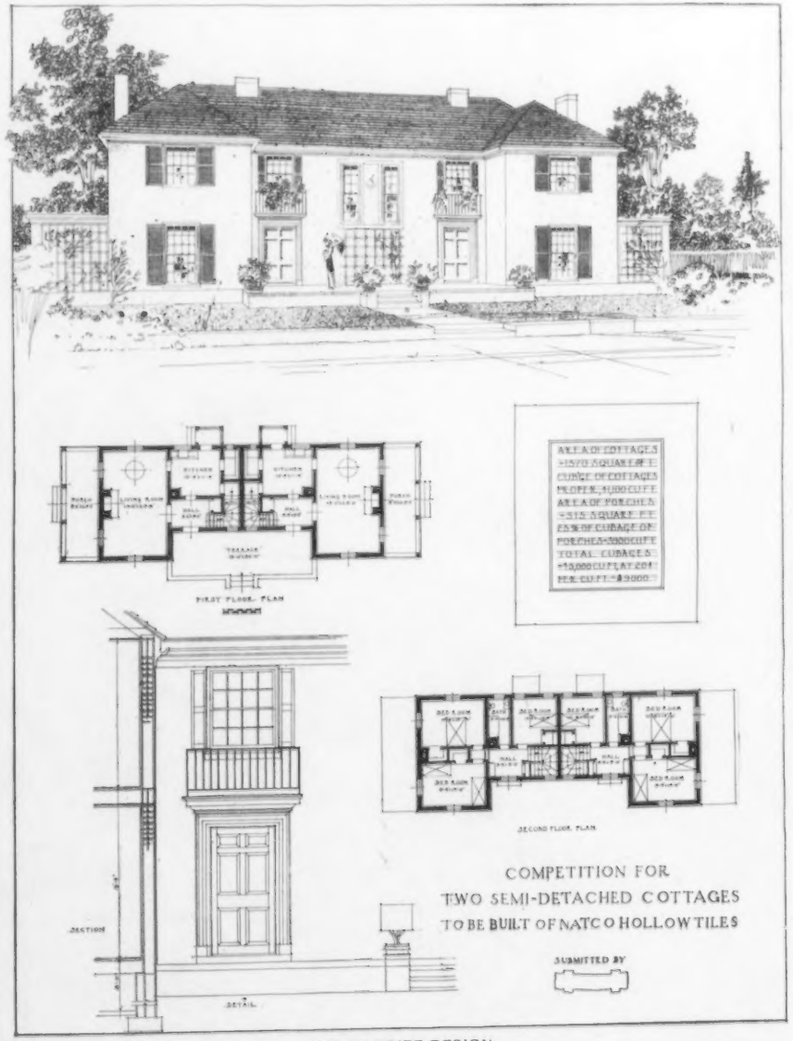
THE problem of a small two-family house is one which has been so often treated as to render anything new extremely difficult of attainment. Moreover, the necessity of basing these particular designs upon the use of stuccoed surfaces of largely uniform character had a tendency to restrict the designs to three general types, namely, the Old Colonial, the English country house, and the Spanish. Under these circumstances the variety of solutions submitted and the general high order of merit was a matter of both surprise and satisfaction to the jury. The results of this competition are an excellent indication of the general advance in design and composition to which the younger generation of American architects are so largely contributing, and, in particular, testify to a very high average of good taste and a strong feeling for simplicity. These facts rendered the duty of selecting the ten best designs one of particular difficulty, as many of the drawings submitted were of almost equal excellence with those premiated.

First Prize. Was awarded for exceptional imagination and originality in the use of the material, this being the primary requisite upon which the judgment was based, according to the terms of the program. This drawing also showed a command of composition and grouping which extended even to the arrangement of the accessories in connection with the rendering, which is particularly to be commended.

In plan, this project is less practical than some of the others. In particular, the rooms marked "Den" are too small to be used for this purpose and might better have been denominated "Coat Rooms," as their real use seems to have been dependent upon the requirements of the exterior effect. On the other hand, this plan shows staircases with square landings, a feature largely neglected in many of the other plans, where winders were the rule. Certain other features, such as the recessing of a space for the kitchen stove, are also to be commended.

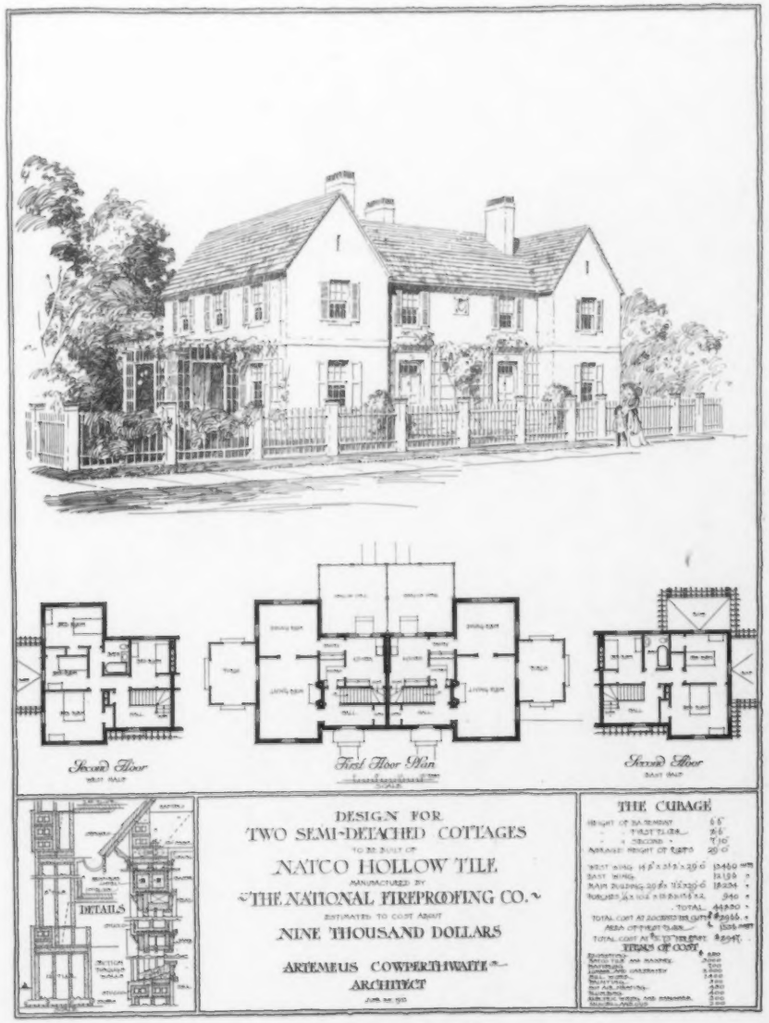
Second Prize. Was awarded to a scheme less interesting in design than the one already mentioned, but showing more careful study in the arrangement of the plan and better knowledge of livable conditions. In particular the grouping of the service in such a way as to be convenient to the street and as not to interfere with the use of the garden, is a point of particular value. This arrangement concentrates the plumbing while keeping the main entrance entirely separate and in direct communication with the garden at the rear. It also carries out the intentions of the program with reference to bedroom facilities. There is no doubt that this would give greater practical satisfaction to an owner than the first prize, although doing less for the advancement of architectural design. The exterior is, however, better than it appears, as its effect is marred by the rendering.

Third Prize. Was given to a simple and attractive design. It would be improved in plan by dividing the living room from the dining room, and as the cubage was well within the requirements, both living and dining rooms, together with the bedrooms above, might have been enlarged to advantage. While this design is well adapted to the use of tile, the actual detail of the construction was



THIRD PRIZE DESIGN

SUBMITTED BY LOUIS SCHALK AND FRANCIS D. BULMAN
SAN FRANCISCO, CAL.



FOURTH PRIZE DESIGN

SUBMITTED BY ALFRED COOKMAN CASS
NEW YORK, N. Y.

poorly indicated and showed a lack of knowledge of the material to be employed. The perpendicularity of the two center windows is also disagreeable, but there is a nice feeling in the detail of the door.

Fourth Prize. Was awarded to a design which, although simple and well considered, was somewhat lacking in originality. In plan the entrance halls are narrow and unsatisfactory, owing to the service arrangement which necessitated a closing off of the staircase. This drawing is commended for good general composition and excellent presentation.

The six drawings following the prizes have been given equally honorable mention and the order in which they are discussed bears no relation to their respective merits.

The mention drawing shown at the left, on this page, shows a simple and attractive exterior with a distinctly homelike charm. It is also very agreeably presented and in particular the free-hand rendering of the plan eliminates much of the stiffness which characterizes the presentation of other drawings.

The mention drawing shown at the right of the same page shows a good livable plan with proper separation of service yard from garden. Certain practical points are, however, forgotten. In particular, no kitchen chimney is shown and this design would, therefore, be unsatisfactory in parts of the country where the gas stove and fireless cooker are not in general use.

The mention drawing shown in the upper right-hand corner of page 186 while attractive is to be criticized for the treatment of the tops of the walls of the bay windows, which in actual construction would result in staining and disintegrating the stucco surface. The difference in the two doorways is out of keeping with the otherwise symmetrical treatment of the elevation. The bay windows also appear to be incorrectly shown in perspective, as they give the effect of rectangular projections which, in point of fact, would have been much better than the sloping bays shown in plan.

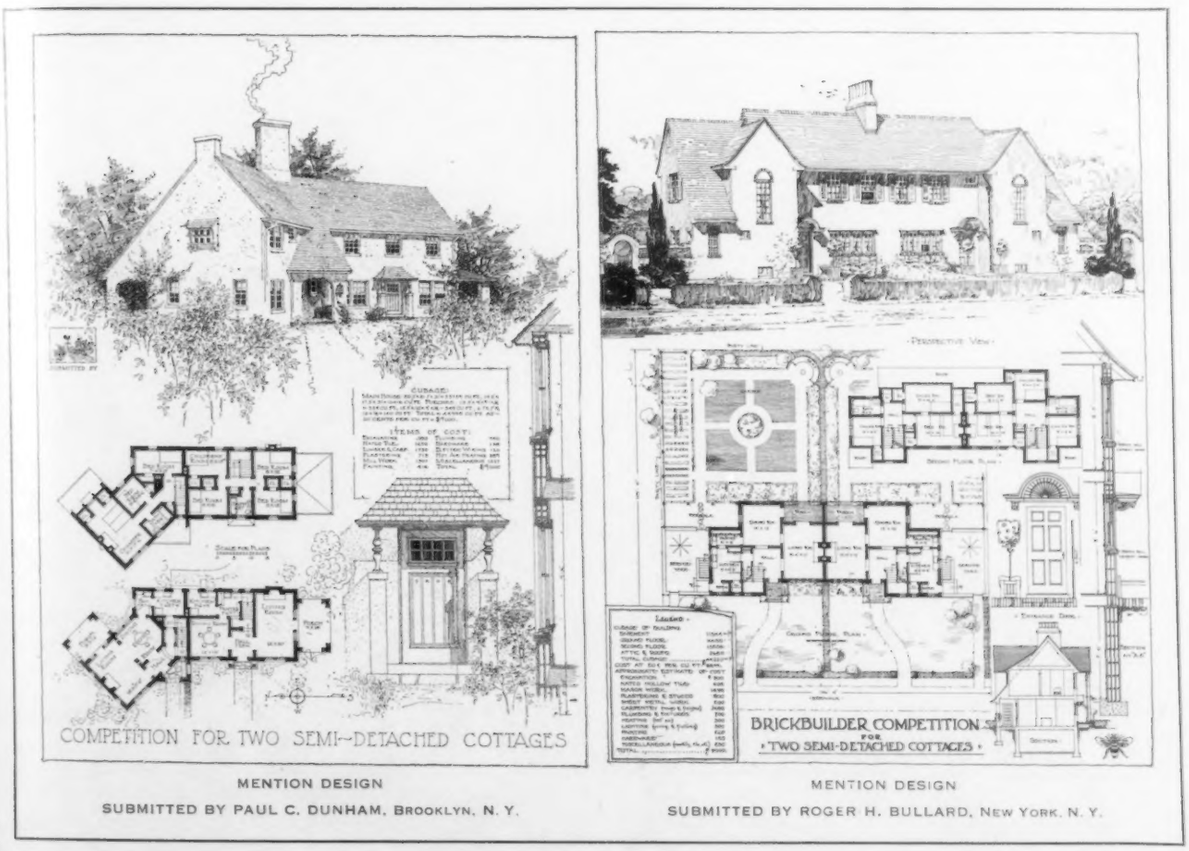
The mention drawing shown in the upper left-hand corner of page 186 shows a simple, straightforward plan, but commonplace and lacking in originality of design. The presentation is also unfortunately complicated.

The mention drawing shown in the lower left-hand corner of page 186 is interesting in general character, but has the disadvantage in plan that it is necessary to pass through either the dining room or living room in order to go from the kitchen to the front door.

The mention drawing shown in the lower right-hand corner of page 186 is simple in plan and beautiful in rendering, but the exterior would be hard and uninteresting in actual execution.

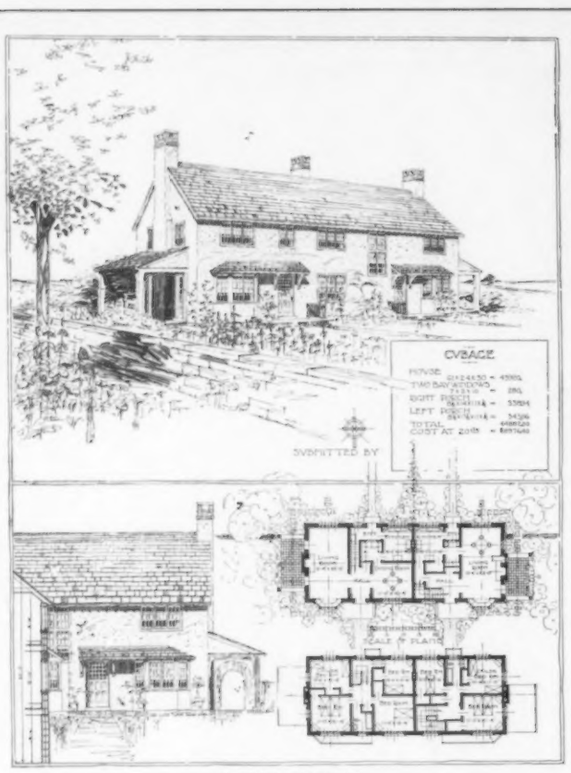
FRANK CHOUTEAU BROWN, Boston,
ABRAM GARFIELD, Cleveland,
WILLIAM H. SCHUCHARDT, Milwaukee,
HUGH TALLANT, New York,
WADDY B. WOOD, Washington,

Jury of Award.



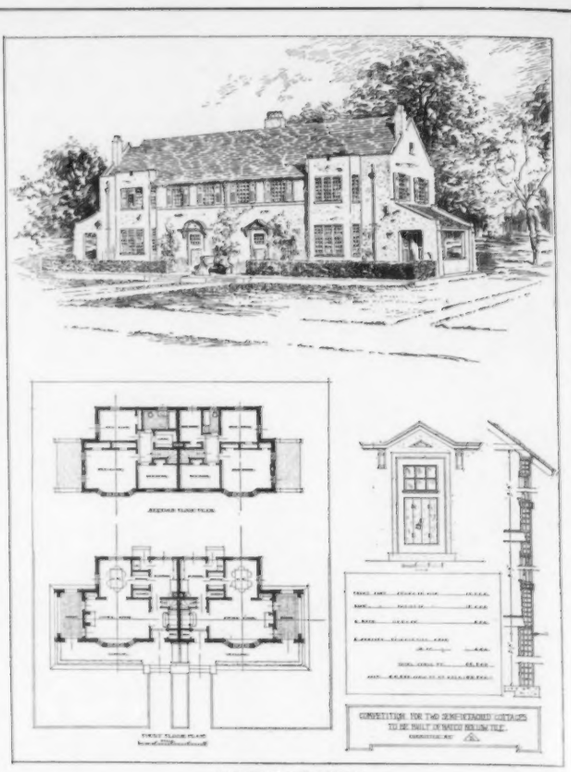
MENTION DESIGN
SUBMITTED BY PAUL C. DUNHAM, BROOKLYN, N. Y.

MENTION DESIGN
SUBMITTED BY ROGER H. BULLARD, NEW YORK, N. Y.



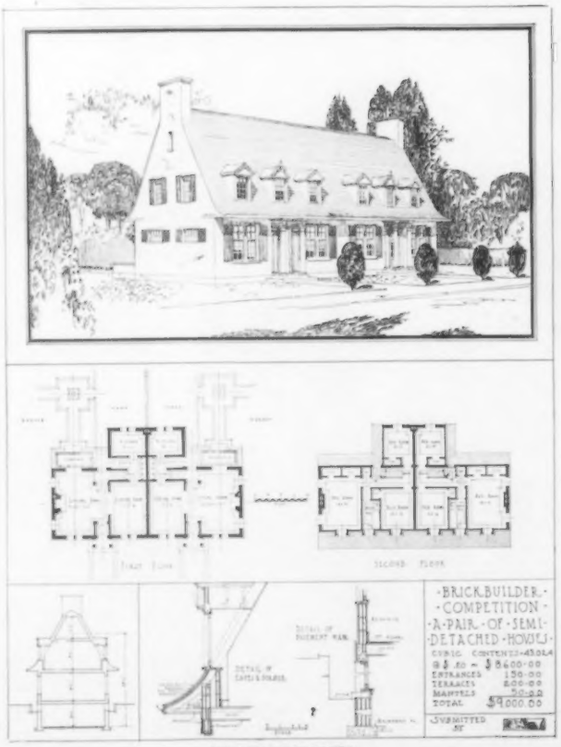
MENTION DESIGN

SUBMITTED BY LESTER E. VARIAN, DENVER, COLO.



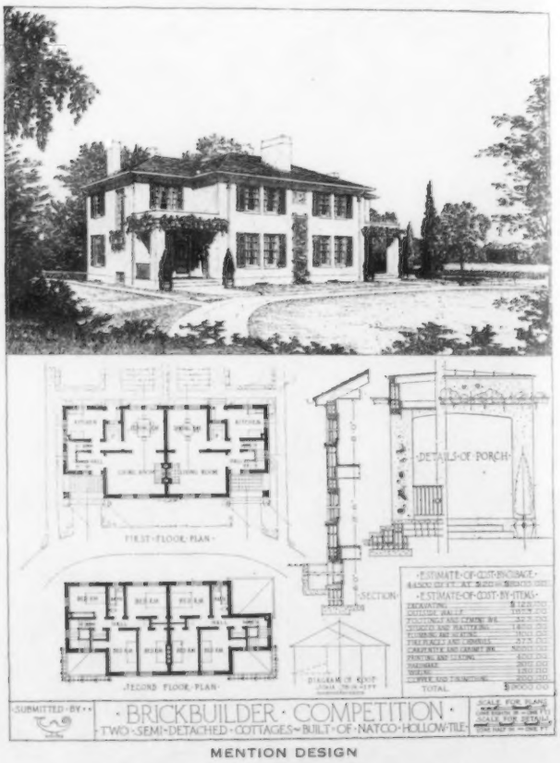
MENTION DESIGN

SUBMITTED BY ROBERT L. STEVENSON, NEW YORK N. Y.



MENTION DESIGN

SUBMITTED BY S. DOUGLAS RITCHIE, MONTREAL, QUE., CAN.



MENTION DESIGN

SUBMITTED BY H. K. CULVER, NEW YORK, N. Y.

Architectural Jurisprudence. — Part IV.

THE ARCHITECT AS ARBITRATOR.

BY WILLIAM L. BOWMAN, C.E., LL.B., OF THE NEW YORK BAR.

IN his ordinary professional employment the architect assumes the unique and exceptional legal combination of an employee or agent for the owner and at the same time arbitrator between the owner and the contractor. Under the usual rules governing the qualifications of an arbitrator, an architect would be ineligible to act or would be disqualified on account of his interest created by his employment by the owner. That the architect and also the engineer should be the only ones to occupy such an exceptionally difficult and supremely honored position may seem strange, but it is nevertheless true. In a late opinion commenting upon this fact one of the judges wrote as follows: "True it confides much to the judgment, impartiality and integrity of the architect; but it has long been a feature in building contracts, and that it obtains to-day as largely as ever shows that experience has approved it." Nor has the architect been given or retained this position without serious legal conflicts. As each new clause of building contracts was put into practice, calling upon the architect to act as arbitrator, it has been questioned whether or not the law should sanction a reference to the agent of one party of such matters as might already be matters of judgment of the architect or which might even cover disputes involving the question as to whether he has himself acted with due skill and competence in advising his employer in respect to the carrying out of the building contract. Now, however, most of our common contract clauses under which the architect acts as arbitrator have been passed upon and held valid by the highest courts.

In this paper we will take up only the positions of arbitrator as set forth in the usual building contract between the owner and the contractor. Hence this does not go into the statutory arbitrations which are now possible under different state statutes and which method is becoming more common as a means of settling disputes that would otherwise call for the delays and expense of a court trial.

Competency of Arbitrator. Generally speaking, any architect may be named or selected as an arbitrator notwithstanding his natural incapacity, or legal disability as infancy or even lunacy; or his disqualification on account of interest, provided such interest be known to both parties at the time of the signing of the contract. There may be circumstances unknown either to the owner or the contractor and calculated to bias the mind of the architect where the court would interfere if called upon so to do. In one case, unknown relationship of the architect to the owner was held a disqualification; in another, relationship and owing the owner a large sum of money. To be indebted to one of the parties in a small way probably does not disqualify, but it should be avoided. That the architect was a stockholder of the building employer has been held to make him incompetent to act. Since the relation between the owner and the architect is such as would ordinarily disqualify the architect from acting as arbitrator where the owner is concerned, the courts are quick to note the existence of any other facts which would further influence the judgment of the architect favorably to the owner. On this account the architect should always be sure and disclose such matters to the contracting parties when he is named in the building contract.

Where the relationship, etc., which would ordinarily tend to create a bias arises after his selection as an arbitrator, the architect is not prevented from acting in this capacity, nor does it revoke the submission. It has been held that where the architect angrily sues and pushes an action at law against one of the parties that such conduct would revoke the arbitration. The contrary has been decided where one of the parties sues the architect. It is hard to see why this distinction just mentioned should exist, and it can be best explained by the fact that the decisions are not in the same jurisdiction or court.

As to whether or not the submission of matters to the architect as an arbitrator can be recalled at any time by either parties, it would seem that the usual rule would apply, namely, that either party could withdraw at any time prior to the rendering of a decision by the arbitrator. There seems to be a tendency in this class of arbitration, however, to make a distinction and as far as possible to sustain the submission. Thus one state has held that if the naming of the architect as an arbitrator has been made in a sealed instrument, it would require a sealed instrument for revocation. In the same case there is also an intimation that the court would consider the revocating of such an important contract clause, such a breach of the contract as would enable the contractor to take advantage of, either by rescinding, or by enabling him to continue the work and to collect whatever damages he might be able to show were sustained by the refusal to arbitrate.

Authority of Arbitrator. Strange as it may seem the architect never knows his full duties until the building contract is signed by the owner with the general contractor or the various contractors who are to do the work of the different trades. He becomes an arbitrator solely under the clauses of the building contract. Thus it would seem that if there is no written contract he would probably have no such powers as we are now about to discuss. Of course in such a situation it is probable that the owner and contractor might, when the emergency arose, call upon the architect to decide, but the architect should be sure that he has received such joint request for his action before taking a hand in the matter. An arbitrator has been defined as "a private extraordinary judge to whose decisions matters in controversy are referred by consent of the parties." His power has been very aptly stated by one judge in these words: "So long as the arbitrator acts uprightly and impartially, and keeps within his authority as designated by the submission, his judgments are unimpeachable and irreversible; he may do what no other judge has a right to do — he may intentionally decide contrary to the law and still have his judgment stand." With

this as a text and motto no architect should ever be at a loss what to do or how to decide in such matters. The honor and dignity of his position and profession should prevent his acting other than justly and equitably.

Whether, under certain circumstances or pursuant to certain contract clauses, the architect is an arbitrator or an agent of the owner, is often difficult to decide. No simple rule of determination can be given. For a general statement of little practical help we say that the intention of the parties would govern. Probably in all "dispute" clauses the architect is arbitrator, also in "construction of drawings and specifications," "extra work," and "payment" clauses except where the architect is definitely stated in a preceding part of the contract to be "the agent of the owner."

Before we consider some of the most common clauses under which the architect acts as arbitrator, one important fact must be kept in mind which will be emphasized throughout, — that an arbitrator must be governed by a strict and literal meaning of the words used to express the submission of the parties.

I. The architect's decision "as to the true construction and meaning of the drawings and specifications shall be final."

This clause has just lately been held valid by the United States Supreme Court. Another court which decided the same way added that there was implied a condition that the decision should be honest. Pursuant to this clause the architect becomes an arbitrator whose decision is conclusive of the matter passed upon in the absence of fraud, or such gross mistake as would necessarily imply bad faith or a failure to exercise an honest judgment.

The decisions considering this clause have held that the architect was not authorized to make a change in the contract; nor to order the work stopped — no question having arisen as to the plans or drawings or the manner of doing the work; nor to determine the rights of the parties as to other matters; nor to determine whether work done by a subcontractor has been performed in accordance with the contract. In one state it has been held that this clause necessarily gives the architect the power to pass upon the question as to whether certain work is extra or not. A summary of the decisions considering this clause deeply impresses one with the fact that the architect's authority is restricted to the literal meaning of the words used.

II. As arbitrator of extra work.

In some states, and especially where the building contract speaks of the architect as agent of the owner, it is held that when the architect passes upon the question of extra work he does so as agent of the owner and not as arbitrator, and hence his decision is not binding upon the contractor. The determination of extra work, its value, etc., must be specially provided for if the architect is to act as an arbitrator, since such extra work being outside the contract would not otherwise be governed by the contract provisions. The architect must find express authority to act before doing so in this regard. This has been decided in cases where excavations are required to be carried below grade; where the work was rendered more difficult at actual increased cost; or where there were losses for materials wrought or supplied. Where the architect was to decide in case of disputes as to the true value of extra work, a court has decided that that did not include the questions whether certain work was extra or not, or whether extra work done at an agreed price was properly done.

Where a contract made the architect "an umpire to determine all questions growing out of the contract" and making him the sole judge of the quality and quantity of work done and material furnished, it was held that his powers did not extend to extra work done outside the contract. Power to pass upon the quantity and quality of work as it progresses does not make the architect arbiter to pass upon the meaning of the contract as to an ambiguous clause. In cases where the architect was to decide all disputes relating to the contract that does not apply to differences as to claims for extras.

III. As arbitrator of disputes.

There are many and diverse expressions covering the matter of disputes. It is impossible to consider but a few of the most important here. Probably the most common forms for such clauses start "if any disputes arise," etc., or "any and all disputes," etc., shall be decided by the architect. They have been held to limit the authority of the architect to cases in which disputes have actually arisen. In these numerous clauses used we also find what seems identical wording held to have contrary meanings in different states. Where the architect was to decide controversies growing out of work specified in the contract, and such contentions or differences as might arise in the premises, it was held that he had no power to annul the contract; on the other hand, where he was to decide "all disputes relating to and touching" the contract, it was held that the question of the dismissal of the contractor must be submitted to the architect for final decision.

A late case involved this wording: "should any disagreement or difference arise as to the true meaning of the drawings and upon any point concerning the character of the work the decision of the architect shall be final and conclusive and binding upon the parties to the contract." The court decided that this limited his power to disputes arising as to the true meaning of the matters mentioned, and he could do nothing with regard to disputes as to delay or liquidated damages for the same.

It would hardly seem necessary to point out that the power of the architect to act under these clauses ceases when the contract is broken or completed. Yet the following incident will show that the contrary opinion has been held by an architect who should have known better. A building had been completed and was apparently satisfactory to both architect and owner and the final certificate had been issued. A payment was delayed because of financial troubles of the owner. Later complaints were made that the building became damp and even that water seemed to penetrate the walls after a heavy storm. The trouble was probably due to the character of the patent blocks which were used and also to poor design as to the method of waterproofing. The owner asked the architect for advice and was told that he could compel the contractor to do the work under Clause V. of the so-called uniform contract. The architect then wrote the contractor that under said clause he demanded that he start at once to perfect the work and make the building watertight, or that the owner would do the work and charge the expense against the contractor. Luckily for the

architect the matter was settled out of court. As a legal proposition the action of the architect was indefensible and if it was a bluff it put him in an unfortunate position had he been compelled to take the witness stand.

In this connection the architect should know that in certifying to the default of a contractor when it is in his opinion sufficient reason to permit the owner to terminate the contractor's employment, he occupies his judicial position, and is bound to act impartially and in due form. Thus where an architect merely wrote the owner a private letter expressing an opinion that the contractor had defaulted so that the owner could discontinue his employment, which opinion was not communicated to the contractor, it was held that the owner was not justified in rescinding the contract. This example then gives us another rule, namely, that in his decisions as arbitrator the architect must act formally and with due notice to both parties concerned.

IV. Arbitration as to payments.

In many jurisdictions the architect is considered as an arbitrator in his making of monthly partial payment or final estimates and in issuing the respective certificates. Such estimates and certificates even if incorrect often give the contractor no cause of action. They are not binding, however, if the architect misinterprets the contract provisions. In other words, the architect cannot oust the court of jurisdiction to construe the terms of the contract or decide the contract rights of the parties. The power to make estimates does not permit the architect to fix another or different price or measurement of compensation. For example, where a contract specifies that the owner shall pay thirty-five cents per cubic yard for earth excavation and seventy-five cents for rock, the architect cannot make a new classification of loose rock at fifty cents. Loose rock is *rock* in that contract and must be paid for at the full price. Nor can the architect refuse compensation for frozen excavation as such for the reason that the contractor might have done the work before cold weather.

Where the architect was required to certify to "all payments" and the contractor, claiming to have completed, quit so that the owner claimed to complete as agent of the contractor, it was held proper for the architect to charge for supervision but not for the rental value from the date of contractor's alleged completion to the date of actual completion, that not being within the submission. Where the architect is made the judge as to when the contract is completed, it has been held that it does not give him the right to pass upon claims for damages for nonfulfilment.

There are many serious questions for the architect regarding the form of wording of his certificates, but it is impossible to go into detail in this paper. Except for the fact that the question has actually arisen, it would seem hardly necessary to state that where an architect is only employed to prepare plans and not to supervise he does not have to make estimates or issue certificates even though he is mentioned in the building contract as an arbitrator in that respect. Consequently, in such case the contractor does not have to have a certificate before he can get his payment from the owner. Certificates, of course, should be signed only by the architect who is the arbitrator, although the data need not to have been personally collected by him. Above all, the certificates should in wording conform to the submission wording in the contract.

V. Negligence of the architect.

Suppose the architect is himself partially or wholly responsible for the conditions which require his action as arbitrator, can he act? The better opinions say no. As a matter of common decency no architect should act under such circumstances. One opinion says: "Nothing short of the most positive and definite agreement of the parties could justify the architect in passing upon the question of whether his own negligence was the cause of the damage. The idea of one acting as an arbitrator where his own conduct is one of the elements to be passed in review is repellent to sound instincts." In a very late case the following is found: "Certainly it could not have been the intention of the parties to deliberately enter into a covenant providing that the arbiter should have the right to pass upon and finally determine questions involving their own failure in the performance of duties." Hence in cases where the disputes arise from delays in furnishing plans or details — delays due to changes; mistakes in plans and specifications necessitating work to be changed and done a second time; delays in decisions — the question is always proper for the architect to ask himself: "Can I or should I in this case act as an arbitrator? Have I the right and if I have can I control my personal feelings sufficient to give an honest and unbiased decision?" The answers depend upon the strict wording of the clause in question and also upon the moral fiber of the architect.

It might not be out of place here to suggest that an estimate is not a certificate, a distinction which is sometimes overlooked. Whether or not a certificate when issued ousts the court of jurisdiction to pass upon the questions involved in such certificate, depends upon whether the architect had the power to act and whether his decision was free from fraud or collusion.

Summary. Our considerations have made clear to us that the most important matter for consideration as to whether the architect is or is not an arbitrator is the wording of the particular clause of the building contract. Since legally such contract may consist of the contract proper and the general conditions attached to the specifications, it is well to see that there is no conflict between these two documents. All such clauses will be strictly construed and no implied powers will be given the architect.

If you are made arbitrator by a clause, remember that you have greater powers than the judges on the bench, hence your decisions should be beyond reproach. The fact that in the exercise of your duties as arbitrator you cannot be held legally responsible for lack of skill, carelessness, or even negligence should create an ambition to merit the honor bestowed. Never forget you are taking the place of the court, and your action may close the door to either party to appeal from your decision. Professional honor and reputation often depend more upon the architect's action in such matters than his pure architectural knowledge, and let him once be guilty of fraud or try as a witness to sustain a dishonest or collusive decision made by him as arbitrator, and he might as well give up further practice of his profession — he is an outcast with whom clients will not deal, with whom reputable architects will not associate, and for whom contractors will not work.

EDITORIAL COMMENT AND NOTES FOR THE MONTH

IT IS interesting to compare the results which have been achieved by our larger cities in regard to the regulation of the height of buildings. There seems to be no uniform method of regulation, and the following statement of building heights is valuable for comparison as well as indicating the conditions which governed the adoption of the respective ordinances.

Baltimore. — Fireproof buildings limited to 175 feet, and non-fireproof buildings to 85 feet.

Boston. — Two and a half times the width of the street; maximum 125 feet.

Buffalo, N. Y. — No height greater than four times the average of least horizontal dimensions of the building.

Chicago. — Absolute limit of 200 feet.

Cleveland. — Two and a half times the width of street, with maximum of 200 feet. Recesses or set-backs to be counted as added to width of street.

Denver. — Buildings not to exceed 12 stories. Those more than 125 feet to be fireproof.

Indianapolis. — No regulations as to height of fireproof buildings, except on Monument Place, which is regulated by State law, where no building shall be over 86 feet.

Jersey City. — No building or structure, except a church spire, shall exceed in height two and one-half times the width of the widest street upon which it stands.

Los Angeles. — Limit of 150 feet is fixed by city charter. This applies to Class A steel frame buildings. City ordinance fixes the limit of height at 133 feet for reinforced concrete Class A structures.

New Orleans. — The height at the street line shall not exceed two and a half times the width of the widest street which the building faces, but any portion of the building setting back from the street may be increased in height up to two and a half times the distance from the face of such offset to the property line at the opposite side of the nearest street.

Newark, N. J. — No building shall exceed 200 feet, but if to be used as warehouses or stores for storage or sale of merchandise, shall not exceed 150 feet.

Paterson, N. J. — Warehouses and stores must not exceed 100 feet in height.

Portland, Ore. — Code of 1911: "No building or other structure hereafter erected, except church spire, shot tower, water tower or smokestack, shall be of a height exceeding 160 feet.

Providence, R. I. — Has height limitation ordinance before council, representing the persistent effort of the local chapter, A. I. A., and Cincinnati, Ohio, is proposing to present ordinance of limitation.

St. Louis. — On streets less than 60 feet, two and a half times the width — maximum 150 feet — except hotels, which are limited arbitrarily to 206 feet. Office buildings may be erected to a height of 250 feet, under special conditions.

St. Paul, Minn. — Not more than 20 stories; 250 feet maximum limit.

Tacoma, Wash. — Class A buildings shall not exceed 12 stories or 152 feet; if all interior as well as exterior is of fireproof construction, same can be 16 stories, or 200 feet.

Washington, D. C. — In the main the limit is the width of the street plus 20 feet; maximum 130 feet on business streets (160 feet on north side of Pennsylvania Avenue), and 85 feet on residence streets.

FELLOWSHIPS OF THE AMERICAN ACADEMY IN ROME.

(PRIZE OF ROME.)

THE following fellowships are *awarded annually* by the Academy, viz.:

A fellowship in Architecture, of the value of $1,000 a year for three years;

A fellowship in Sculpture, of the value of $1,000 a year for three years;

A fellowship in Painting, of the value of $1,000 a year for three years;

Two fellowships in Classical Studies, each of the value of $1,000 a year, which may be renewed for a period not exceeding three years.

The awards are made on competitions which are open to unmarried men who are citizens of the United States; if in the fine arts, to men only; if in classical studies, to men and women, who comply with the regulations of the Academy.

Information as to the terms and conditions of the competitions may be obtained from the Secretary of the Academy, 101 Park Avenue, New York City.

The advantages, which the Academy offers, place the American student, who is successful in obtaining one of its fellowships, on a par with the holder of the Grand Prix de Rome, and it should exert an influence upon art in America, no less important than that which the French Academy has exercised upon the art of France, and in a broader field, for it stands for the art of expression in every form and offers as great an opportunity to the student of history as to the artist.

COMPETITION DRAWINGS.

WE have in our possession many drawings which have been submitted in THE BRICKBUILDER competitions. In every instance these drawings are being held because the return postage has not been sent us, although we have advised every owner of the drawings of this fact two or more times.

We hereby give notice that unless postage ($.25 in stamps) is sent to us between now and October 1, 1913, all these drawings will be destroyed. Upon receipt of postage the drawings will be immediately returned.

ROGERS AND MANSON COMPANY,
85 Water Street, Boston, Mass.